

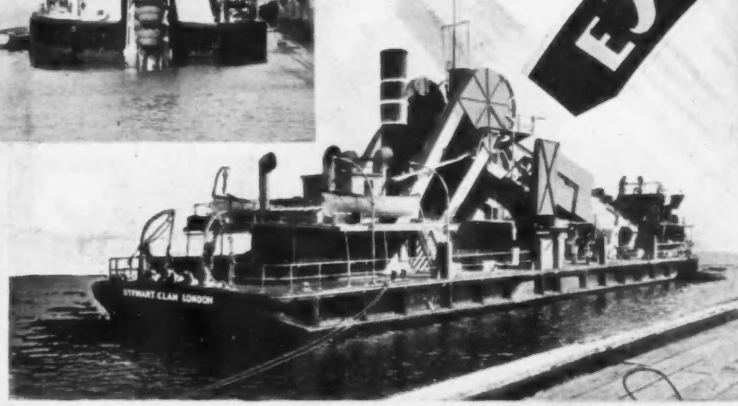
The Dock & Harbour Authority



No. 190. Vol. XVI.

AUGUST, 1936

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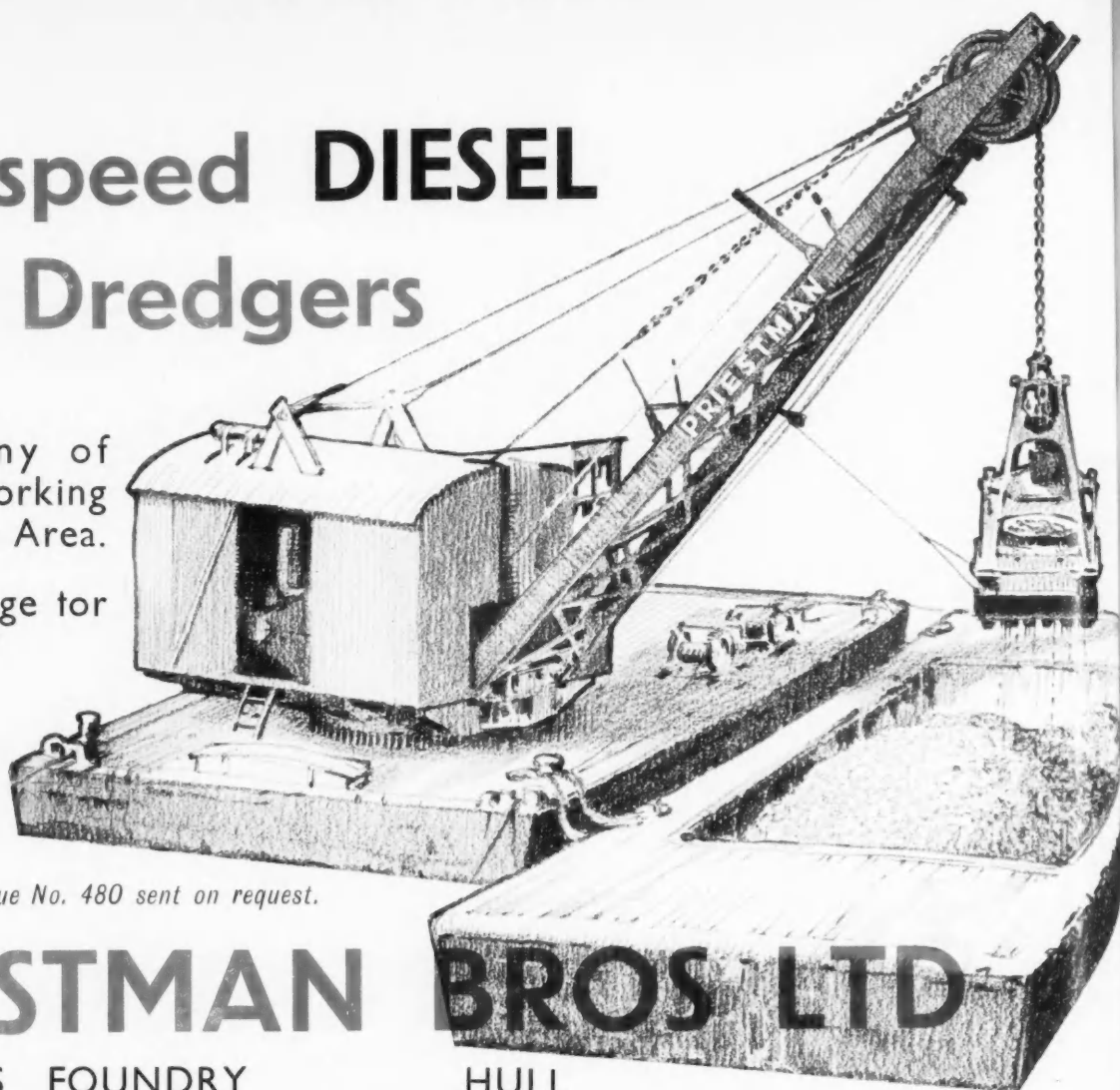
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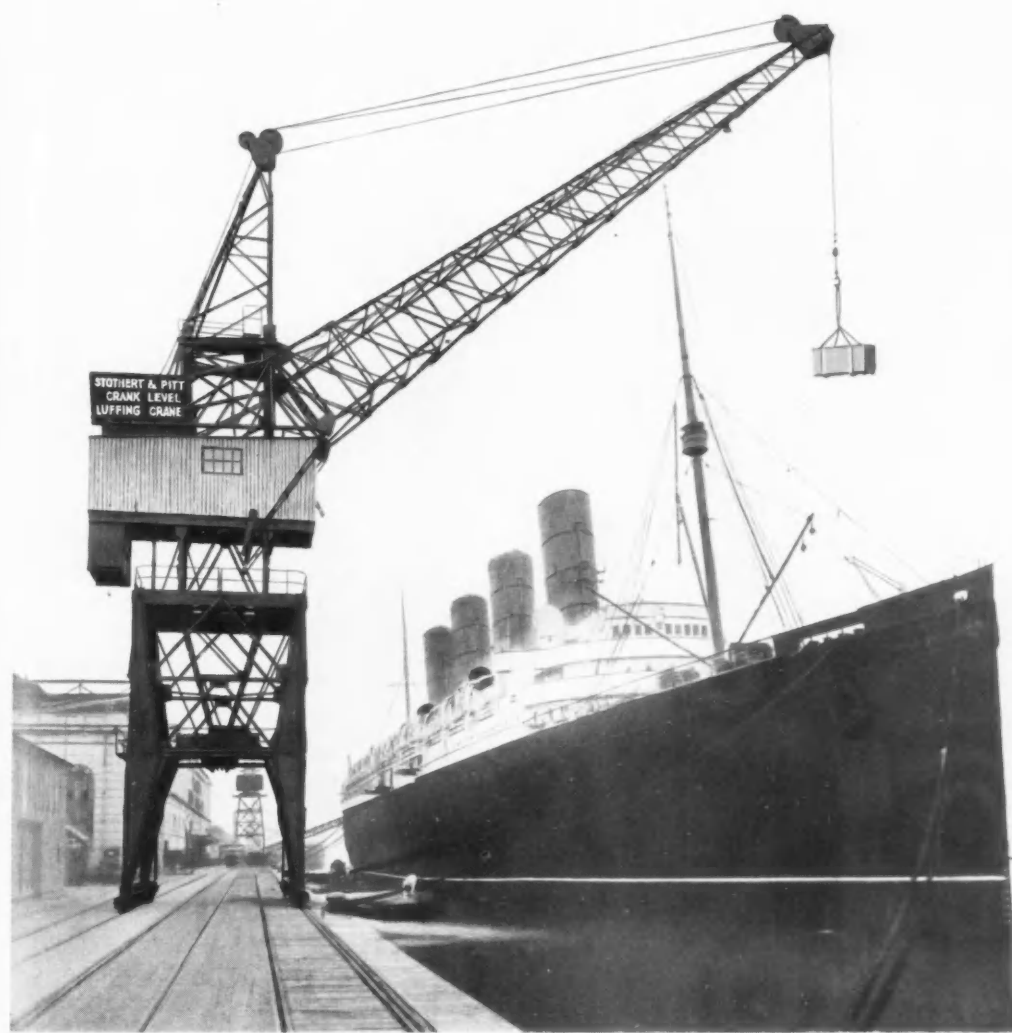
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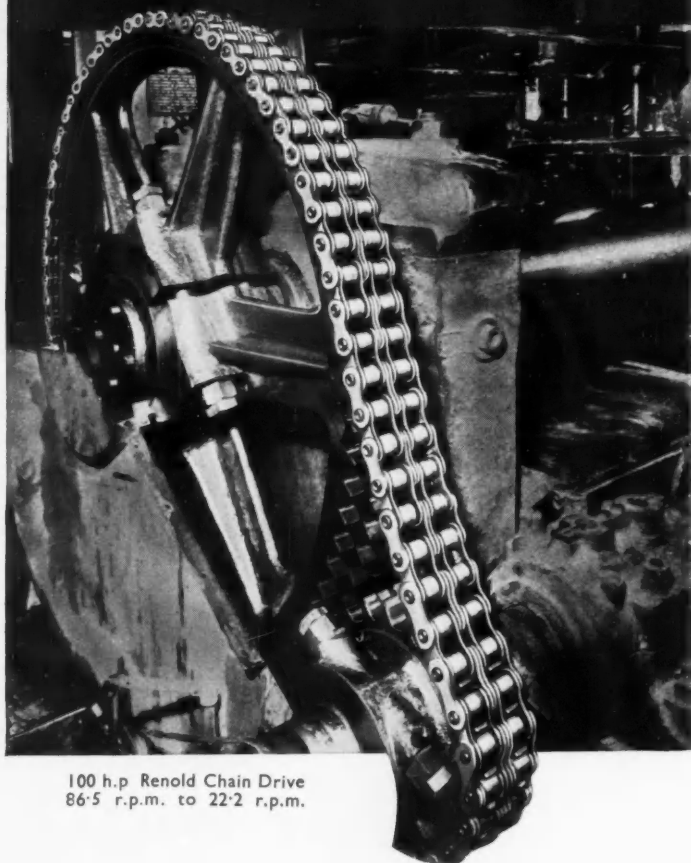
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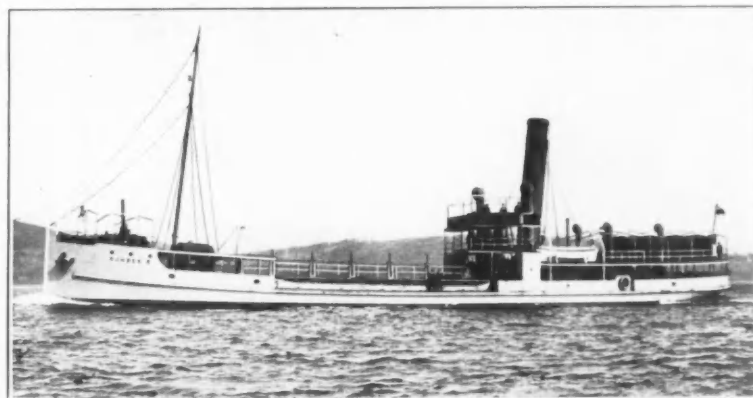
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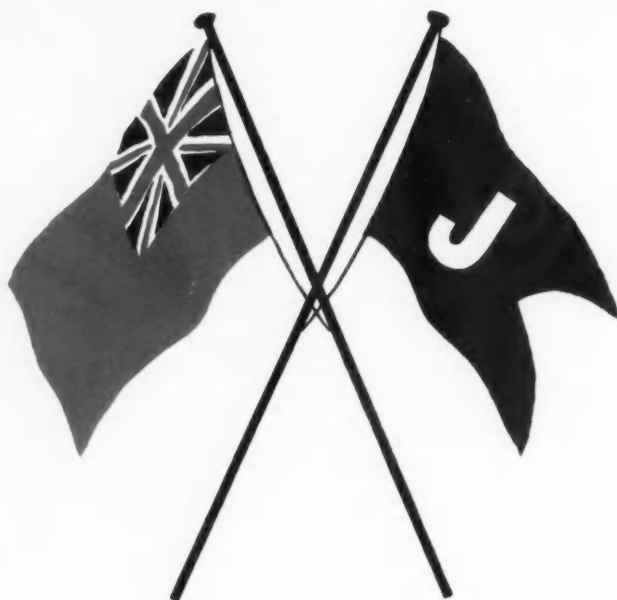
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Contributions which are to be paid for must be clearly marked thus; otherwise they will be considered gratuitous

If intended for publication in the current month they must come to hand not later than the 20th of the preceding month.

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THE DOCK & HARBOUR AUTHORITY

No. 190. Vol. XVI.

AUGUST, 1936

Editorial

Liverpool's Increased Dock Traffic.

Mersey Docks and Harbour Board issues the annual statistics which show an improvement in the number of vessels arriving at and departing from Liverpool, in the tonnages, in the rates received on the ships, and in the rates and dues on goods. The number of vessels totalled 19,028 for 1935, an increase over the previous year of 1,044.

The grand total of the tonnage of vessels for the year ended 1st July was 21,023,956 against 20,478,492 for the year before, an increase of 545,464 tons. These figures represent the total net register of vessels paying rates to the Board, inwards or outwards, as the case may be. To arrive at the total tonnage which entered, and the total tonnage which left the Mersey, it is necessary to double the figures.

Regarding the rates received on vessels, the total for the year ended 1st July was £1,511,090, inclusive of receipts on conservancy account, compared with £1,505,548, inclusive of receipts on conservancy account for the year before—an increase of £5,542. The total rates and dues on goods received for the year ended 1st July was £1,018,472, against £957,421—an increase of £61,051.

The grand total of rates on vessels and rates and dues on goods for the year ended 1st July, inclusive of receipts on conservancy account, was £2,529,563, compared with £2,462,970 for the previous year, an increase of £66,593.

The approximate weight of goods for the year ended 1st July, on which dues were paid, is estimated at 14,500,000 tons, compared with 13,600,000 tons for the previous year.

Control of the Tyne.

Much of the time of the closing session of the Royal Commission on Tyneside Local Government at the latter part of June was devoted to hearing evidence regarding the control of the River Tyne from representatives of Newcastle City Corporation, the River Tyne Commission and Tynemouth Corporation.

Alderman Walter Lee, Chairman of the Trade and Commerce Committee of Newcastle Corporation, said the Committee were of opinion that, subject to adequate compensation being paid to Newcastle, one central port authority would be in the interests of the City and meet the requirements of the district. If the Commission believed it to be best that the river undertakings should be transferred to one authority special provision should be made to protect the staffs affected. Alderman Lee said reasons for arriving at the conclusion that there should be a single port authority were:—Amalgamation would avoid the competition at present existing between the several local authorities and other bodies particularly in connection with the construction of quays and the charges for the use of such quays; it would avoid duplication in advertising, and would lead to unification of charges such as river and quay dues, and possibly lead to a reduction in those charges; it might lead to a standardisation of rates of pay for labour, and would tend to bring about development of both sides of the river.

Councillor R. A. Anderson, Chairman of the Trade and Commerce Committee of Tynemouth Corporation referred to the importance of their fish quay and its ancillary industries which they regarded as vital to the town. So far as the control of the river was concerned Tynemouth Corporation did not appreciate any need for a change.

Colonel Sir Frank Simpson, Deputy-Chairman of the Tyne Improvement Commission, said nothing should be done which might mean increased rates to those using the river facilities, and that the Commissioners should not be asked to saddle themselves with liabilities without adequate indemnity to prevent such increases.

Mr. H. P. Everett, Chairman of the Tyne Improvement Finance Committee, said it was the considered opinion of the

Commissioners that in the event of absorption by them of municipal quays they must have safeguards against deficits from the working of such quays.

Mr. W. A. Souter, Vice-Chairman of the Docks Committee, expressed the opinion that it would be to the advantage of the trade of the port to have shipping facilities in the hands of one authority as there would be uniformity of policy and control.

Mr. Albert Blacklock, Secretary to the Tyne Commission, replying to questions by the Chairman of the inquiry (Sir Angus Scott), said that the Tyne Improvement Commissions' dues compared more than favourably with those of most other big ports in the United Kingdom. They were sufficiently low to attract shipping.

Evidence as to transport was then taken, and later the hearing was closed, it being stated that the Commission's report would eventually be issued as a Blue Book by Parliament.

Manchester Ship Canal Company.

The Traffic Receipts for the month of June, 1936, amounted to £106,191 against £108,365 (adjusted) in June last year, a decrease of £2,174.

The Traffic Receipts for the half-year ended 30th June, 1936, amounted to £650,965 as compared with £625,444 (adjusted) for the corresponding period of last year, an increase of £25,521.

The net revenue of the whole Undertaking for the half-year (after providing for interest and fixed charges) was £6,780 more than the corresponding half-year in 1935.

The Port of Cochin, India.

It has taken sixteen years to turn Cochin into a deep-sea port, but within a few weeks from now it will be declared one of the major ports of India. When Mr. R. C. Bristow, the Engineer, first arrived on the scene in 1920, he had to spend some months building up the neck of the peninsular which shelters Cochin harbour, for the sea threatened to break through at that point and ruin permanently the project in view.

Following this a thorough investigation was needed of the flow of currents in the backwater, which has an area of 125 square miles. Not until 1925 was a special dredger built, for the purpose of making a channel through the bar of sand three miles wide, which blocks the entrance to the port. During the monsoon months, however, it was quite unsafe for this dredger to operate. All its work had to be done seasonally. The material dredged was passed through hundreds of feet of pipe and dumped on to an island in the harbour. This process was complicated by the sea-swell which continually threatened to break the pipe or its supports.

The channel finally cut was 11,000 feet long, 400 feet wide and 32.5 feet deep. In addition, the island has been reclaimed and fitted with wharves. The greatness of the whole achievement can be appreciated from one occasion, when in exactly four weeks the dredger cut a channel of nearly two miles, 450 feet in width. Very nearly ten million cubic yards were dredged in all.

Cochin is now the first sheltered port on the West coast of Madras province. Formerly all cargoes were loaded three miles out at sea, and ships sometimes had to wait for days before the lighters could reach them for this purpose. It is also the only Indian port on the direct routes to Australia and the Far East. Its development is expected to prove decisive as a stimulant to the trade and industry of Southern India. Indeed, it is interesting to recall that this was the first place in India to be visited by an European ship. It was in the year 1500 that the Portuguese chose the natural harbour of Cochin as an anchorage.

The Panama Canal

Construction of Additional Diesel Oil System of Pipe Lines

At a cost of \$102,000 The Panama Canal will soon begin the construction of an additional Diesel oil system of pipe lines which will improve the service to ships by supplying Piers 15, 16 and 18 at Balboa, the Pacific terminus, with this fuel. The work will be completed by about January 1.



Pacific Entrance and Balboa Harbour.

At present, a Diesel vessel berthing at any one of these piers must be shifted to Pier 4, 6 or 7 if it requires fuel. The bulk of cargo handling is concentrated at Pier 18 which is covered and affords ample warehouse facilities, while only passengers, mail and baggage can be adequately taken care of at the smaller piers. This condition has resulted in considerable delay to cargo laden vessels, and the added expense of hiring tugs for movements from dock to dock.

Under existing conditions, vessels at Balboa with 20 tons or more of cargo to handle over the pier have no choice but to shift to and from Pier 18 to take required Diesel bunkers inasmuch as it is not possible to load or unload conveniently more than 20 tons of cargo at the piers where Diesel lines are now established.

The specifications call for a 10-inch supply pipe line to be run from the pumping station at La Boca to outlets at Piers 15 and 16, a distance of more than two miles in view of the necessary loops in the line. An 8-inch line will make the circuit under Pier 18 and have a number of independent outlets spaced 100 feet apart. Extra heavy wrought iron piping will be used.

Despite the limited facilities at Balboa for the purpose, 700,000 barrels of Diesel oil were taken on ships at that port during the last year, as compared to 500,000 at Cristobal, the Atlantic terminus, where there are nine berths with Diesel oiling equipment.



Photo by courtesy of U.S. Army Air Force]

General View of Balboa Terminals.

The rapid development of the Diesel internal combustion engine has had a marked effect in stimulating the traffic of motorships through the Canal in the past 14 years. In 1921, for example, there were only 99 transits by motorships, a figure representing only 2.8 of the 2,736 commercial vessels using the Canal and 3.2 of the total annual tonnage. Of the 5,180 vessels making the transit in 1935, there were 1,753 motorships, or an increase up to 33.8 per cent. of all the commercial ships passing through the Canal in that year.

Statistics show that between 1921 and 1935 the total sale of Diesel oil to ships at the Canal has increased from approximately 70,000 to about 1,200,000 barrels annually.

A revolutionary change in the mercantile marine was foreshadowed in 1912 by the appearance of the Danish motor freighter, "Selandia," built in Copenhagen, and said to have

been the first successful ocean-going Diesel motor vessel. Progress in the further development of the internal combustion engine was retarded by the World War, but beginning in 1921, the construction of motorships was begun on a large scale.



Interior of Shed on Pier No. 18, Balboa.

The notable advance in the number of motorships throughout the world employing Diesel oil is shown by the fact that there were only 912 vessels in 1920 with a total tonnage of 752,636, compared to 4,941 in 1935, with a tonnage of 10,604,526. During the last 12 months alone there has been an increase of 700,000 in the tonnage of the world's motorships.

As the total motorship tonnage at present amounts to only 17.4 per cent. of the aggregate tonnage owned in the world, it is apparent that the field for development is still almost unlimited. In keeping pace with this trend toward still wider use of the Diesel engine, the Panama Canal has had an opportunity to service with the oil almost twice as large a percentage of the commercial vessels making transits last year as is indicated by the percentage figures for the entire world.

A comparison between the employment of coal and oil fuel at present as contrasted with the year 1914 shows that slightly over 50 per cent. of the world's tonnage now depends entirely on coal, while in 1914 the percentage was 89. In the past 22 years the tonnage of steamers using coal has decreased by more than 11,000,000 tons.

Extension of Freihafen 1, Bremen.

In the Bremen Budget for 1936 a sum of 2,240,000 Rm. was set aside for the purpose of completing the reconstruction of the south side of Hafen 1, commenced in the year 1931, and continued from then on.

Besides widening the quay for the purpose of laying a third quay rail and further dredging, 24 new whip cranes are being set up in place of the former hydraulic cranes. These cranes have three tons carrying capacity each.

It is stated in the press that Bremen has the most up-to-date crane plant, and was the birth-place of the whip crane, and that, due to this equipment, Bremen has carried out loading and discharging of cargoes in a manner approached by no port on the Continent.

Each of the new whip cranes costs 54,000 Rm. making a total of 1,296,000 Rm. for these alone. In addition the cranes must have electric meters and 11 electrical windlass plants at a cost of 5,500 Rm. each=60,500 Rm., and current supply plant of 113,000 Rm. are being installed. The rails will cost 215,000 Rm. A considerable portion of the work will probably be completed (for approximately 2,000,000 Rm.) by the 31st March, 1937.

Total cost of the new extension will amount to 4,550,000 Rm. Through the further extension of the Freihafen 1, considerable sums will be earned by the iron and machine industries. A loan of 2,000,000 Rm. for the work is to be granted by the Gesellschaft für öffentliche Arbeiten. However, in view of the interest service, it may be assumed that the Budget funds will be used first, after which advantage will be taken of the "Oeffa" loan.

In connection with the modernisation of Bremen harbours it may be of interest to note that the present plant value of the ports of Bremen and Bremerhaven, including railways, sheds, cranes, etc., amounts to approximately 320,000,000 Rm. and that from 1827 up to 31st March, 1934, Bremen has expended approximately 325,000,000 Rm. for reconstruction of her harbours.

The Strength of the Walls and Floors of Dry Docks

By S. C. BAILEY, Assoc.M.Inst.C.E., F.G.S.

(continued from page 236)

In Fig. 3 the completed dock and filling are shown, with water in the dock up to H.W.O.S.T., but with no hydrostatic pressure at the back of the walls, or under the floor.

In this case the moments of the earth pressure, and of the water in the dock balance one another thus:—

$$M. \text{ of earth} = 51.8 \text{ tons} \times 25 \text{ ft.} = 1295 \text{ ft. tons.}$$

$$M. \text{ of water} = 37 \text{ tons} \times 35 \text{ ft.} = 1295 \text{ ft. tons.}$$

The wall is therefore not affected by unbalanced lateral pressures. The weight of the wall is increased by the backing and the vertical water on it to 152.3 tons, resulting in pressures of 5.3 tons on the heel, and 2.7 tons per sq. ft. on the toe, again assuming no good adhesion between the concrete of the floor with that of the wall, while under the floor the weights on the ground amount to from 2.6 to 2.79 tons per sq. ft.

The floor is still acting as a strut between the walls, but they will not slide as the coefficient of friction is 0.5, and $152.3 \times 0.5 = 76.15$ tons lateral pressure would be required to move the walls, while the maximum earth pressure is only 51.8 tons per sq. ft. and this is balanced by the lateral water pressure. Should the concrete of the floor have set, and the toe of the wall be extended by 20 ft., the pressure at the heel will be 5.0 and at the new toe 2 tons per sq. ft. As the 20 ft. is an assumed distance for the toe extension, it may safely be taken that the loads will be spread further into the body of the floor, in which case the pressures on the ground will be still more reduced, providing that the ground will stand 5 tons per sq. ft. Now, if the soil will not stand up to more than 4 tons per sq. ft. without settlement, there will be an element of danger here, as the walls may break away from the floor at the junctions, but at a distance of 20 ft. from the back of the wall the pressure will be 4 tons, so there will be a triangle of extra pressure at the heel amounting to an average of $\frac{1}{2}$ ton per sq. ft. or a total of 10 tons, acting at 6.6 ft. from the heel of the wall, with a leverage of 31.4 ft. to the junction with the floor, giving a bending moment of 314 ft. tons.

The moment of inertia of the floor at the toes of the walls is

$$B.D^3 \quad 1 \times 18^3$$

$$\frac{12}{12} = \frac{12}{12} = 486 \text{ ft. units, and the stresses will be}$$

$$\frac{M \times Y}{I} = \frac{314 \times 9'}{486} = + 5.8 \text{ tons per sq. ft.; this is about half}$$

the maximum tensile strength of 1-2-4 cement concrete, so there is not much margin of safety.

In the diagram Fig. 4 the dock is shown with water inside, also at the backs of the walls, and under the floor, with a head up to H.W.O.S.T.

In this case the weight of the rubble backing is reduced by the water, and it is assumed that there is no pressure from the filling, for if the water can get at the back of the wall freely, it is also pressing against the compact although porous filling, keeping it from exerting its full pressure against the wall, and should the filling be pressing hard against the wall it is squeezing the water out.

Of course, if the filling is more or less waterlogged, there will be considerable earth pressure, but in that case, calculations should be made for waterlogged filling alone, which would weigh about 127 lbs. per cub. ft. and have flatter angles of repose and rupture than drier material.

In the figure the water pressures on each side of the wall are unbalanced, the moments being as follows, viz:—

$$M. \text{ of water at back of wall} = 70 \times 23.3 \text{ ft.} = 1631 \text{ ft. tons}$$

$$M. \text{ of water in dock} = 37 \times 35 \text{ ft.} = 1295 \text{ ft. tons}$$

a difference of 336 ft. tons in favour of the water at the back of the wall, this will act at the mean C.G. of the two opposing

$$(70 \times 23.3') + 37 \times 35'$$

$$\text{forces, which will be} = \frac{336}{70 + 37} = 27.3 \text{ ft. from the}$$

$$\text{foot of the wall, and the effective pressure at the back of the}$$

$$\text{wall will be} = \frac{336}{27.3} = 12.3 \text{ tons, which will result in a pressure}$$

$$\text{on the heel of the wall of 0.4 ton, and on the toe of 3 tons}$$

$$\text{per sq. ft.}$$

The weight of the floor is 150 tons, and the water on the floor to H.W.O.S.T. level weighs 172.8 tons, or a total of 322.8 tons, less the upward water pressure under the floor which is 240 tons, this leaves a downward pressure of 82.8

tons or 0.66 ton per sq. ft. and the floor will still be acting as a strut between the walls.

In Fig. 5 the dock is illustrated free of water, but occupied by a ship on the blocks, and weighing 70 tons per lin. ft. It is assumed that there is no water pressure at the backs of the walls, only earth pressure, nor is there any water pressure under the floor. A surcharge of 5 cwt. per sq. ft. at the surface of the ground, and a crane load on the wall are provided for. These loads will result in a pressure of 0.15 ton at the heel, and 7.5 tons per sq. ft. at the toe of the wall, assuming no cohesion of the concrete of the floor with that of the wall, but at this stage the concrete will probably have set, and the toe of the wall may safely be extended 20 ft. into the floor, resulting in pressures of 2.8 tons at the heel and 3.4 tons per sq. ft. at the extended toe. The total weight of the wall with the extended toe, and including the load on it from the ship is 181.6 tons, this multiplied by 0.5, the coefficient of friction, gives 90.8 tons as the force required to push the wall, and the lateral pressure of the earth is only 58 tons, so the wall will not slide, nor would it without the extended toe.

The weight of the ship being 70 tons per lin. ft. and of the floor 150 tons, giving a total of 220 tons, results in a pressure on the ground of 1.8 tons per sq. ft.

The load from the ship is spread over the width of the floor at angles of 45 degrees from the blocks, and the floor will still act as a strut.

In Fig. 6 the dock is shown empty, but with full hydrostatic pressure up to H.W.O.S.T. at the backs of the walls, and under the floor. The resultant line of pressure through each section of the wall is shown, giving a thrust outside the toe of the wall of 88 tons inclined at 38 degrees to the horizontal.

The weight of the wall after deducting upward water pressure is 52.5 tons which multiplied by the co-efficient of friction 0.3 gives 15.75 tons as the lateral pressure that would cause the wall to slide towards the dock, and the water pressure at the back is 70 tons so that the wall will be pressing hard against the floor. The upward water pressure under the floor amounts to 240 tons and the weight of the floor is 150 tons, so there will be an upward pressure of 90 tons.

If the floor is considered as a beam uniformly loaded and with fixed ends the bending moments will be as follows, viz:—

$$W.L. \quad 90 \times 120'$$

$$B.M. \text{ at junction with walls} = \frac{12}{12} = \frac{12}{12} = 900 \text{ ft. tons}$$

$$W.L. \quad 90 \times 120'$$

$$B.M. \text{ at centre of floor} = \frac{24}{24} = \frac{24}{24} = 450 \text{ ft. tons,}$$

$$\text{and the stresses on the floor 18 ft. thick at the walls will}$$

$$\text{be equal to} \quad \frac{M \times Y}{I} = \frac{900 \times 9'}{486} = + 16.6 \text{ tons per sq. ft.}$$

$$\text{and at the centre 22 ft. thick they will be} = \frac{450 \times 11'}{887.3} =$$

$$+ 5.57 \text{ tons per sq. ft.}$$

It is clear, therefore, that the floor could not stand these tensile stresses at the walls without fracture if it acted as a beam without steel reinforcement, the maximum tensile strength of 1-2-4 Portland cement concrete being from 10 to 14 tons per sq. ft.

In Nov., 1892, the late Sir Benjamin Baker, M.Inst.C.E. (*M. Proc. Instit. C.E., Vol. CXL, March 1893, p. 95*) drew attention to the fact that the floor of a dock must, when under such water pressure, be acting as an inverted arch, producing a thrust on the walls, and the walls also are exerting a thrust on the floor.

The exact radius of this concealed arch is more or less problematical, and it will be necessary to consider it as an arch of a radius that will not give too excessive a compression on the concrete consistent with safety, or too much thrust on the walls.

If a concealed arch in the concrete of the floor is assumed of 200 ft. radius at the invert, and 400 ft. at the soffit, with a thickness of 10 ft. at the centre and 15 ft. at the walls, and having a versed sine of 8 ft., the horizontal thrust for a uniform

$$W.L. \quad 90 \times 120'$$

$$\text{load will be equal to} \quad \frac{8.V.}{8 \times 8} \text{ therefore} \quad \frac{90 \times 120'}{8 \times 8} = 168.75 \text{ tons,}$$

$$\text{say 169 tons, and at the walls the thrust will amount to 175}$$

The Strength of the Walls and Floors of Dry Docks—continued

tons. This is met by an inclined thrust of 88 tons from each of the walls, which can be resolved into 72 tons acting parallel to the thrust from the arch, the two thrusts forming opposing forces with different leverages, giving as a result a net thrust from the floor of about 160 tons, this on a 15-ft. thick arch at the walls will give 10.6 tons per sq. ft. and 15.4 tons per sq. ft. for the correspondingly reduced thrust of 154 tons at the centre 10-ft. thick.

These are not excessive loads in compression for concrete in the proportions of 1-2-4, which has a crushing strength of 2500 lbs. per sq. inch or 160 tons per sq. ft. at 28 days, and 3500 lbs. per sq. inch or 225 tons per sq. ft. at 6 months old.

The 160 tons inclined thrust from the arch at the wall can be resolved into a horizontal pressure of 155 tons, and allowing 15 tons for sliding friction, the ground being wet, and the weight of the wall having been reduced to 52.5 tons by the upward water pressure, the thrust is further reduced to 140 tons. This is opposed by the resistance of the earth filling to compression in the 75 ft. height of the wall; assuming that the resistance at the surface is 1 ton per sq. ft. and at the base of the wall 4 tons per sq. ft. or an average of $2\frac{1}{2}$ tons per sq. ft., this will give 187.5 tons resistance to the lateral thrust. Should the earth filling at the backs of the walls not be capable of resisting the pressure, the walls will be pushed back by the

thrust from the floor, which will no longer act as an arch, but as a beam, the centre will be forced up, and it will probably crack. This shows the importance of firmly consolidating the filling at the back of the walls, especially at the bottom.

There is one other condition that has not been dealt with, and that is: Assuming there is a ship on the blocks in the dock, which is empty of water, but the dock is subject to full hydrostatic pressure to H.W.O.S.T. at the back of the walls and under the floor.

In this case the pressure on the walls will be as shown and described under Fig. 6. The weight on the floor from the ship will be 70 tons, and that of the floor will be 150 tons, giving a total of 220 tons, while the upward water pressure under the floor will be 240 tons, leaving an upward pressure of 20 tons on 120 ft. width or 0.16 tons per sq. ft., which is negligible. As regards the resistance of the dock to flotation under water pressure up to H.W.O.S.T. neglecting the friction of the ground at the back of the walls, and possible suction under the floor; the water displaced per lin. ft. of dock amounts to 13,378 cub. ft. which divided by 35 cub. ft. = 382 tons.

The net weight of the two walls is 250 tons, and that of the floor is 150 tons, or a total of 400 tons, leaving a dead load of 18 tons per lin. ft. in favour of the dock not lifting.

Irish Harbour Matters

Lower Rates when New Ships are Built.

THE Dublin Port and Docks Board has refused an application by the British and Irish Steam Packet Coy. for reduced port dues to cover some proposed new vessels for the Dublin-Liverpool service.

These ships, it was stated by the company would carry passengers and cargo only, as against "composite" ships carrying passengers, cargo and live stock, and were intended to develop the tourist traffic.

In its report, however, the Committee suggested that the matter might be reconsidered if, and when, the new ships were built.

When the Committee's report was presented to the Board, Mr. David Barry, managing director of the British and Irish Steam Packet Company, said that the company was considering the building of a type of vessel which had not been used in and out of Dublin port before. The ships they contemplated building would cost over £300,000 each, and would mean a big increase in the port's revenue. He feared that, as a result of the Committee's decision his company would not go on with the scheme, because it would mean that instead of paying dues at the rate of £25 per day, they would be paying £65 per day.

The Chairman (Mr. C. M. O'Kelly) said that the Board was anxious to help the project, but could find no precedent for such a reduction at other ports.

Mr. Barry said that Belfast Harbour Board had been prepared to give a 15 per cent. reduction in dues for this class of ship, but under their Act of Parliament they were unable to do so.

Major Hollway pointed out that the Committee would recommend the Board to fall into line with Belfast's decision when the ships were built.

Cork as an Air Port.

The suitability of Cork Harbour for the establishment of a trans-Atlantic seaplane base and aerodrome, was stressed in the experts report on this matter placed before the Cork Harbour Board on 24th June.

A conference of local public bodies who originated the idea two years ago is to be summoned again to deal with the matter. These bodies are, the Cork Harbour Board, and all the sub-committees appointed by the body in conjunction with the Cork Corporation, Cork County Council, and the Cove Urban Council.

The report, compiled by Messrs. Chamier, Gilbert, Lodge and Co., air consultant engineers, London, favours Site No. 1 as an air base and favours area A as a land aerodrome.

The symbols "No. 1" and "Area A" refer respectively to Rushbrooke Dockyard area, and to a site some 2,500 yards East of Middleton, which is in a direct line with the town and Cork City.

A number of influential Cork citizens have decided to go ahead with plans to establish an airport for the City and Port of Cork. The decision of the people concerned has further been influenced largely by the fact that Cork Harbour is the

first European port of call for many of the trans-Atlantic shipping services, and is, therefore, an ideal site for the establishment of an aerial connecting service with Great Britain and the Continent, especially as regards mails, which can be transported from Cork to London and from Cork to Berlin, with a saving of as much as one and three days respectively.

Galway Harbour Development.

Galway Harbour Board is dissatisfied with the progress made in the development of the harbour under the Galway Harbour Act, 1935.

The Secretary of the Board, at which the complaint was made, said that he had written to Sir Cyril Kirkpatrick, the engineer, about the matter and Sir Cyril had replied that many of the contracts were in the hands of the printers, and added "I estimate the date on which the above documents will be completed as about the end of August; by that date also I expect the bills of quantities will also be ready."

Mr. O'Flaherty said he understood the work would be started by the beginning of August. The shipping companies were complaining that the Board was doing nothing to get the work started.

The Secretary submitted a bill of costs from the Board's solicitors and Parliamentary agents, amounting to £2,559. A sum of £8,000 had been paid out in all. It was decided to have the account taxed.

The Chairman of the Board, Mr. E. Corbett, promised to do what he could to have the loan for the development of the harbour, speeded up.

The Port of Copenhagen.

The number of ships which entered the Port of Copenhagen during June, 1936, was:—From inland ports, 1,885 steam and motor-ships of 227,176 n.r.t. and 16 sailing vessels of 2,962 n.r.t. arrived. Shipping arriving from foreign ports amounted to 975 steam and motor-ships of 483,274 n.r.t. and 20 sailing vessels of 7,230 n.r.t. The total of steam and motor-ships and sailing vessels arriving from both inland and foreign ports for June, 1936, amounted to 2,896 vessels of 720,642 n.r.t.

Bombay Port Trust.

At the meeting of the Trustees of the Port of Bombay, held on 16th June, 1936, the Chairman announced that the Accounts for the year ended 31st March, 1936, had been closed, and showed a surplus, including Pilotage Account, of Rs. 3.18 lakhs. Though Revenue was less by nearly one lakh of rupees, Expenditure was over seven lakhs less than last year.

Sanction was accorded to the expenditure of Rs. 16,000 for the renewal of docks hydraulic pressure pipes, and of Rs. 10,000 for repairs to the Victoria Dock caisson.

A reduction of the export wharfage charge on petrol by half was sanctioned, subject to the sanction of Government, with a view to fostering the development of this traffic from Bombay to coastal ports.

Notes from the North

Accurate Dock Weighings.

MR. E. G. BROWNBILL, stated that the Mersey Docks and Harbour Board had in the traffic dept. two inspectors of weighing who made a spot check of the weighing performed by the master porters at appropriated and unappropriated berths on the estate. The results of these spot checks for the last half-year were remarkable. With regard to the weighing of cotton (other than Egyptian), 358 vessels were visited and 7,675 bales were reweighed, of which 99.89 per cent. of the bales tested were practically correct. Egyptian cotton tests were made at 33 vessels, when 1,170 bales were reweighed, of which 95.72 per cent. were practically correct. With respect to general goods, visits were paid to 2,144 vessels and 18,000 drafts were reweighed, the whole of which were practically correct.

Widening River Mouth.

Sir John Wolfe Barry and Partners, consulting engineers, have submitted to the Rhyl Council a report dealing with the river mouth training scheme. They state the contractor has commenced work on the excavation for widening the river on the south side of "Horton's Nose," where about 2,000 cubic yards of material have been removed. This material is being utilised for raising and levelling up the ground which will be used as a yard for pile construction, etc., and will form a permanent improvement to the Council's property at "Horton's Nose." A start has also been made with driving the steel sheet piling in front of the West Promenade wall. Work has been commenced at the embayment opposite Sydenham Avenue, and will be continued westward. Pits have been sunk where the line of piling will cross the old 18 inch sewer pipes and the new 30 in. sewer to ascertain the exact position of the pipes and arrange for their protection. A further quantity of plant and materials has been delivered at the site.

Ribble Navigation.

Good progress has been made during the past year in the maintenance and improvement of the Ribble navigation. On the occasion of the annual inspection by members of the Preston Town Council, Mr. A. H. Howarth, the Ribble Engineer, reported that so far as ample depth of water was concerned, the past year had generally been devoid of any great anxieties such as were experienced during the drought years of 1933 and 1931.

From the 14½ miles point seawards, the navigable channel, due to the extension of the south training wall, showed further welcome improvement. In 1933 the line of the intended channel seawards of the 14½ miles was occupied by a formidable sand bank. In 1934 a narrow shallow channel 200 feet wide had been forced through this sand bank by the constraining of a greater volume of ebb tidal water running for a longer period and directed by the extension of the south training wall on to the sand bank. By 1935 this narrow shallow channel, due to further extension of the south wall, had been widened to 550 feet, and deepened considerably while this year the width had been increased to over 700 feet and the depth increased over the bank by 18 feet. What was a sand bank three years ago with a height of 2 ft. 3 ins. above zero, now had a depth in places of 18 feet, below low water in the navigable channel—a scouring away of a depth of sand of over 20 feet.

The channel, until the start of the construction of the extension to the south training wall in 1932, was continually altering in position, and through insufficiency of water and tortuousness, was difficult of navigation for large vessels. The construction of the extension of the south wall had all along been accompanied by almost immediate improvements in the channel depths following the wall, and with the completion of the training walls the increase of depth would, he felt sure, be so pronounced that no great difficulty would be encountered in securing and maintaining a deep, easily navigable channel at the mouth of the river. This would be an inducement to larger vessels to come to Preston.

Mr. J. G. Merriweather, the general superintendent, stated that the Port of Preston was handling an increasing amount of trade, and the figures for June showed an increase in revenue of £3,362, compared with June, 1935.

During the year the combined imports and exports amounted to 988,121 tons, which, while showing a decrease of 12,157 tons from last year's record figure, remained the second highest total in the history of the port, being 58,361 tons better than the year 1924, when the total was 929,760 tons.

The total net registered tonnage of all vessels using the port was 523,592, and the number of ships dealt with was 1,476. The number of ships from foreign ports was 234, with a total net registered tonnage of 301,756, an average of 1,328 tons a vessel. The deepest drafted vessel to enter the port

docked on a draft of 22 feet. The vessel carried the largest cargo to be discharged from one bottom, 6,139 tons.

The total weight of imports for the year was 737,354 tons, a decline of 61,976 tons from last year's record. Wood pulp imports totalled 219,559 tons, a decrease of 5,547 tons. Motor spirit showed a decrease of 35,428 tons, but this was due to the removal of the Texas Company to Liverpool. Roadstone decreased 7,332 tons, due in a large measure to the keen competition from inland quarries, but grain, china clay and cement continued to improve. The import of 41,193 tons of grain was the highest since 1908, while china clay (29,673 tons) had its best year since 1930. Cement created another record with 18,177 tons. Bitumen, although showing a reduction of 2,811 tons, recorded a total which was the second highest since the inauguration of this business in 1929. The importation of pit props, a newly established business, reached a total of 15,834 tons.

With regard to exports, the total weight of 250,767 tons showed a very satisfactory increase of 49,839 tons.

In only two previous years (1926-27 and 1934-35) had the operations of the Ribble Committee resulted in a larger gross surplus than that of the past year, when there was a margin of income over expenditure of £64,342, as compared with £74,551 in 1934-35 and £67,195 in 1926-27.

Whitehaven Harbour Board.

Mr. J. H. Cant, who was re-elected chairman of Whitehaven Harbour Board at the annual meeting referred to the loss of trade at the harbour through the closing down of Whitehaven pits over eight months ago. The harbour, he said, derived 80 per cent. of its revenue from the shipping of Whitehaven coal. If money could not be found from private sources to re-open the mines, surely the Government could step in with a loan on a 3½ per cent. basis as they had offered to do for another undertaking. Something like £200,000 a year was being paid out at Whitehaven for dole, and he suggested that if such a sum was offered to the pits they would be restarted in a month.

Demand for Fish Dock.

Birkenhead Chamber of Commerce is renewing the campaign for the provision of a riverside fish market and dock at Birkenhead.

Mr. Martin Pyke said that if the scheme were successful it would provide work for 1,500 men, and in four years' time it might absorb 10,000 men and women. He suggested the Chamber should communicate with the Corporation regarding the natural facilities that Birkenhead possessed for fisheries as compared with Liverpool. Plymouth had no facilities, yet they had a fish market which was recognised throughout the world. He moved a resolution that they communicate with the Corporation pointing out the natural facilities which existed at Birkenhead for establishing a fishing port.

Mr. T. G. Simpkins, referring to the allusion to Plymouth, pointed out that the Plymouth docks belonged to the Great Western Railway Company, but there were no railway facilities at the docks. The questions of the establishing of a Fishing Board in Liverpool was exhaustively dealt with some time ago and it was concluded that it was not a practical proposition to establish such a scheme in Birkenhead. If a conference was to be held on the matter, he thought it was desirable that Birkenhead should be represented. If the scheme proved after all to be a practical proposition, then at least Birkenhead should be considered in conjunction with Liverpool.

Mr. T. W. H. Humphreys said that when the matter was last before them it was made quite clear that the establishment of any Fisheries Board in Birkenhead would entail the Mersey Docks and Harbour Board in considerable expense, and they were unable to assure the Dock Board that anything like that expense would be justified.

Mr. Pyke pointed out that for 22 out of 24 hours there were natural landing facilities in Birkenhead and a boat with a 9 or 10 feet draught could land at practically any hour of the day. There was not a port in the country which enjoyed the facilities for landing that they had on Merseyside. At places like Grimsby and Hull they had to wait for the tides.

Port of Ghent.

During the month of June, 1936, 140 ships of 150,215 n.r.t. entered the Port of Ghent, as compared with 146 ships of 170,309 n.r.t. in the corresponding month of 1935. This is a decrease of six vessels and 20,094 n.r.t.

For the first six months of 1936, 1,025 vessels of 1,048,857 n.r.t. entered the port, as compared with 873 vessels of 918,009 n.r.t. in the corresponding period of 1935. This is an increase of 152 vessels and 130,848 n.r.t. this year.

North-East Coast Notes

More about Tyne Dock.

At the time of writing the General Purposes Bill of the London and North-Eastern Railway Co., which *inter alia* seeks sanction for the sale of Tyne Dock to the Tyne Improvement Commission, was under consideration by a Select Committee of the House of Lords. The Bill was opposed by the Railway Clerks' Association and the National Union of Railwaymen, who were seeking to protect employees who might be affected by the transfer of the Dock, but the stage had been reached at which Lord Milne, who presided over the Committee, intimated that the Bill would be allowed to proceed so far as the opposition of the two unions was concerned, but further consideration of the Bill would be adjourned.

It had been previously explained to the Committee that a condition of the contract between the Railway Company and the Commissioners was that the Commissioners should have freedom of choice in the matter of taking over the staff at present employed at the Dock. The staff is about 360 strong, and it was probable that the Commissioners would take over 200 of these men, and the Railway Company would have no difficulty in absorbing the 160 others, but the Commissioners might not be able to pay the men the same rates as the Railway Company had done. It was proposed, however, to deal with problems of that character.

Trade at North-East Coast Ports.

An unofficial estimate of the coal shipments for the first six months of the year from North-East Coast Ports puts the total at 12,803,689 tons, compared with 12,862,247 tons for a like period of 1935, which, having regard to the loss of trade with Italy, should be regarded as fairly satisfactory. Up to the moment official figures were only to hand for the first five months, and were as follow:—

	1936	1935
	Tons	Tons
Tyne	5,435,121	5,600,513
Blyth	2,827,628	2,579,627
Wear	1,702,056	1,630,923
Hartlepool (6 months) ...	1,600,953	1,682,027

It should be noted that the Tyne and Wear figures embrace coke shipments as well as coal.

The improved condition in shipping is indicated by the notable decrease of idle tonnage in the Tyne. At the end of May there were 44 vessels laid up of 82,723 net register tons, whereas at the same date a year ago there were 72 vessels of 158,167 tons idle, a reduction of roughly 75,000 tons.

Newcastle Quay Development.

Another development of Newcastle Corporation Quay was opened in June when a large transit shed at Nos. 25 and 26 berths was brought into operation. The shed is 312 ft. long, 100 ft. wide, and 19 ft. high. The contractors for the shed were the Lambhill Ironworks, Ltd. Alderman Lee, Chairman of the Trade and Commerce Committee of Newcastle Corporation, who formally opened the shed, said that, judged by the trade that had followed all their developments, they could prove that the facilities thus provided were all essential. The Newcastle Corporation Quays now extend along 7,278 ft. of the water front and provide 27 safe berths for large vessels at all stages of the tide.

Local Port Charges.

Recently two interesting announcements regarding charges in local ports have been made. At a meeting of Blyth Harbour Commission, it was reported that, commencing on July 1st and until further notice, all harbour dues would be subject to a discount of 10 per cent. The Chairman drew attention to the fact that the coal shipments had continued at such a satisfactory level that it was found possible to give the dues-payers the benefit of this discount.

The second announcement was that the sea-towage charges at the Hartlepool had been reduced by a halfpenny, that is from 3d. to 2½d. per net register ton. The change was officially notified by the London and North-Eastern Railway Co. owners of the docks, and who supply tug service for vessels entering and leaving the port. The charge of 3d. per ton, which had been in operation since 1920, was reduced on July 1st.

Lloyd's Register Shipbuilding Returns for the Quarter ended 30th June, 1936

The statistics issued by Lloyd's Register of Shipping regarding Merchant Vessels under construction at the end of June last show that in Great Britain and Ireland there is an increase of 6,371 tons in the work in hand as compared with the figures for the previous quarter. The present total of tonnage under construction—848,732 tons—exceeds by 288,411 tons (or upwards of 50 per cent.) the tonnage which was being built at the end of June, 1935, and is the highest quarterly total recorded since December, 1930. It exceeds the aggregate tonnage now under construction in the four leading countries abroad.

About 64,000 tons—7.6 per cent. of the tonnage now being built in this country—are intended for registration abroad or for sale.

The tonnage now under construction Abroad*—1,102,273 tons—is about 124,500 tons more than the work which was in hand at the end of March last.

The leading countries abroad are:—Germany, 365,179 tons; Japan, 156,811 tons; Holland, 148,005 tons; Sweden, 124,250 tons; United States of America, 90,275 tons; and Denmark, 71,620 tons.

Of the tonnage being built abroad, 394,034 tons (or 35.7 per cent.) are intended for registration elsewhere than in the Country of Build.

The total tonnage under construction in the World* amounts to 1,951,005 tons, of which 43.5 per cent. is being built in Great Britain and Ireland, and 56.5 per cent. abroad. The quarterly total for the world shows an increase of 130,891 tons over the figures at the end of March last, and is the highest recorded since March, 1931.

In Great Britain and Ireland, construction was commenced upon 282,322 tons during the last three months, an increase of 49,799 tons as compared with the corresponding total for the March quarter. During the quarter ended June last, 167,958 tons were launched in Great Britain and Ireland, a decrease of 26,317 tons as compared with the previous quarter. Similar figures for abroad are 390,452 tons commenced, and 298,854 tons launched, showing, as compared with the previous

quarter, an increase of 38,336 tons in the tonnage commenced, and of 96,453 tons in the tonnage launched.

Steam and motor oil tankers under construction in the world amount to 79 vessels of 656,626 tons, of which 23 vessels of 179,980 tons are being built in Great Britain and Ireland, 16 vessels of 141,380 tons in Germany, 9 vessels of 77,140 tons in the United States of America, 8 of 73,800 tons in Sweden, 8 of 57,540 tons in Holland, 4 of 37,570 tons in Denmark, 4 of 34,865 tons in Japan, 3 of 20,220 tons in Spain, and 1 of 15,456 tons in France.

Of the 848,732 tons under construction in Great Britain and Ireland at the end of June, 430,146 tons consisted of motorships, while at the same date the motorship tonnage being constructed abroad (754,085 tons) was 410,002 tons in excess of that of the steamers.

The vessels being built in the world at the end of June include 8 steamers and 38 motorships of between 8,000 and 10,000 tons each; 8 steamers and 24 motorships of between 10,000 and 20,000 tons; 3 steamers and 2 motorships of between 20,000 and 30,000 tons; and 1 steamer exceeding 30,000 tons.

The table respecting marine engines shows that the horse-power of steam engines now being built or being fitted on board amounts to about 658,000 h.p.; this figure includes 64 sets of turbine engines of about 280,000 shaft horse-power. The horse-power of the steam reciprocating engines (about 378,000 h.p.) represents 21.8 per cent of the total horse-power of marine engines now being built in the world. The figures for oil engines aggregate approximately 1,075,000 h.p., and comprise 62.0 per cent. of the world's total horse-power of marine engines under construction.

Tonnage to Lloyd's Register Class.—Of the merchant shipbuilding in hand throughout the world at the end of June, 1,342,970 tons, or nearly 69 per cent., are being built under the inspection of Lloyd's Register. Of this total, 760,610 tons, representing almost 90 per cent. of the tonnage being built there, are under construction in Great Britain and Ireland; while, of the tonnage being built abroad, 582,360 tons, or 52.8 per cent., are being constructed under the inspection of Lloyd's Register.

*Excluding Russia, for which no figures are available.

Hull and the East Coast

Humber Bridge Project.

THE members of the Humber Conservancy Board are getting anxious about the project to construct a road bridge across the Humber from a point near Hull to the North Lincolnshire side of the river, and at the last meeting a resolution was adopted instructing the Clerk to visit the Board of Trade and obtain what information he can about the scheme. The matter arose out of the Minutes of the Works Committee at whose meeting a recommendation was adopted as a result of the Chairman drawing attention to a question asked and answered in the House of Commons on May 28. The member for the Brigg Division of Lincolnshire had asked the Minister of Transport if he was in a position to make a statement as to the proposal to erect a bridge across the river Humber, and if not, when would he be able to do so. Mr. Hore-Belisha replied, "The Government are unable to say more than that—the proposal is under consideration by my Department." In consequence of this, the Works Committee resolved "That it be a recommendation that, as the Conservancy Board's request to be furnished by Hull Corporation with particulars of the new Humber Bridge scheme has not yet been complied with, the attention of the Corporation be called to the answer of the Minister of Transport, and that the Corporation be informed that the Conservancy Board assume that the Ministry could not be examining the proposal without being in possession of full particulars."

At the Board Meeting, Councillor Cargill, stressing the duties of the Commissioners as guardians of the river remarked that the position was extraordinary and suggested that stronger measures should be taken to obtain the information to which they were entitled. The Chairman (Mr. J. H. Fisher, J.P.) said that he did not think they should go further at that meeting and pointed out that the Chairman of the Parliamentary Committee of the Hull Corporation, the sponsors of the scheme, had been seen and had given their assurances that all there was in the scheme was what had been put before the Works Committee.

Mr. W. Minnitt Good asked if an undertaking given at a private interview was binding upon the Hull Corporation? It did appear to him that the Minister of Transport must be in possession of full details or he would not be giving the scheme consideration. Mr. Good added that he could not conceive for one moment that a responsible Minister would waste his time on a feeble scheme; he would not put his Department to the trouble and consequent expense of examining a scheme unless he had full details before him. He thought it was time some pressure was put on the Hull Corporation, or the Conservancy Board would be in the dark up to the last moment.

The Chairman expressed the view that it was a delicate thing to press the Board of Trade.

Councillor Cargill said that his only object in bringing the matter up was that he did not want the Board to be faced with a great legal battle, as once before, involving them in the expenditure of thousands of pounds. He did not think a matter of such great interest should be shrouded in mystery. Ultimately, Commander Clementson moved and Mr. F. W. Porter seconded the resolution that the Clerk should go to London and seek an interview at the Board of Trade and this was adopted and the minutes confirmed.

Victoria Dock Improvements not Settled yet.

Discussions between the representatives of the London and North Eastern Railway and the special Committee of timber importers regarding the proposed improvements at the Victoria Dock, Hull, are still in progress. A capital outlay of £150,000 is contemplated, but before embarking on the work the railway-owners of the Dock are insisting on the importers coming in to an agreed scheme by which they will guarantee to the railway company a larger share of the traffic than is now the case. It is estimated that approximately 50 per cent. of the timber arriving at the Victoria Dock from abroad is sent away by road transport which it is contended is not fair to the railway company who own and have to maintain the dock. The proposal is to re-arrange the dock warehouses, etc., so that additional discharging berths may be provided. In view of the great increase in the timber trade at Hull in recent years, the Victoria Dock is no longer equal to requirements and during the busy import season delays to incoming vessels and dock congestion have been frequent. The new season is now well under way and enormous quantities of sawn wood are coming to land from Sweden, Finland, Russia, etc., and creating scenes of the greatest activity.

Every effort is being made to expedite the traffic, but delays, perhaps not so serious as in some seasons, are inevitable. It is hoped that the negotiations for an improved dock will be concluded soon and that before another year the important scheme projected by the London and North Eastern Railway will have been carried into effect. Hull now imports annually far in excess of a million loads of wood, hewn and sawn.

Coal Exports from the Humber Ports.

The exports of coal from the Humber ports (Hull, Grimsby, Goole and Immingham) to places abroad during the second quarter of the year amounted to 757,203 tons, as compared with 781,139 tons in the corresponding period of 1935. This brings the total for the six months, January to June, to 1,387,373 tons as against 1,507,206 tons, a decrease of 209,893 tons. The falling off in the quantity exported was mainly in the early weeks of the year when there was a shortage of supplies of coal available for export owing to the heavy demands in land industries and public undertakings under the fear of a stoppage in the colliery areas—a contingency happily not realised. The report of the Humber District Association of Chartered Shipbrokers mentions that the shipping trade of the Humber ports generally speaking has been fairly well maintained, the exceptions being coal export and bunkering. Unfortunately, whilst sustained efforts have been put forward by the coal exporters, the shipping committee of the Shipbrokers Association and strong representations made from time to time in Parliament the trade remains in "a most languishing condition." It can only be hoped (continues the report) that it is not too late for this branch of industry to recover in order to be placed on something like its former and normal proportions when the Humber was looked upon as a very important coal exporting and bunkering centre. According to the returns of the Shipbrokers Association the total shipments (exports foreign and coastwise, bunkers, etc.) from the Humber in 1935 reached a total of 7,350,843 tons.

Traffic at Hull Docks.

The traffic at the Hull Docks during the second quarter of the year was in some directions not quite so heavy as in the preceding quarter, but on the whole was about maintained at last year's level. Taking the six months' period, the imports of wheat and kindred cereals amounted to 643,000 tons, an increase of 105,600 tons over the corresponding period of 1935. Arrivals of oilseeds, nuts and kernels approached 350,000 tons and were somewhat behind.

Timber exceeded half-a-million loads and showed a good increase. Petroleum at 70 million gallons, however, was 11 million gallons down and there was a decrease also in the quantity of sheep's wool imported. Butter, eggs, lard, etc., showed a good advance. The import fruit trade, however, is still seriously handicapped by tariffs, import quotas and the like.

Port of Rotterdam

The Chamber of Commerce and Industry of Rotterdam has issued the statistics concerning the movement of sea-going ships in the New Waterway, and which are as follows:—During June, 1936, 1,147 ships of 1,879,421 n.r.t. entered the Port of Rotterdam, as compared with 840 ships of 1,341,909 n.r.t. during June, 1935. The number of ships entering for the small ports in the environs were 221 of 445,751 n.r.t., as compared with 191 ships of 404,859 n.r.t. in June, 1935.

For the first six months of the year, January to June, 1936, 6,088 ships of 9,974,611 n.r.t. entered the Port of Rotterdam, as compared with 5,578 ships of 8,708,339 n.r.t. in the corresponding period of 1935. The number of ships entering for the small ports in the environs of Rotterdam during the first six months of 1936 were 1,224 of 2,565,116 n.r.t., as compared with 1,175 ships of 2,387,233 n.r.t. in the corresponding period of 1935.

After deducting the number of ships counted more than once in the different ports, the number of entrances in the month of June, 1936, amounted to 1,293 vessels of 2,156,359 n.r.t., as compared with 985 ships of 1,617,654 n.r.t. in June, 1935. For the first six months of 1936, the total entrances were 6,895 vessels of 11,391,233 n.r.t., as compared with 6,190 ships of 10,067,184 n.r.t. in the corresponding period of 1935. These figures are for the whole region of the Port of Rotterdam with its environs, comprising the delta formed by the mouths of the Rivers Rhine and Meuse.

Aden Port Trust

The following are the returns of shipping using the Port of Aden for the month of May, 1936:—

	No.	Tonnage
Merchant Vessels over 200 tons ...	129	528,904
" " under 200 tons ...	4	486
Government Vessels ...	17	24,282
Dhows ...	153	5,354
PERIM.		
Merchant Vessels over 200 tons ...	6	20,463

The total value of imports, excluding Government Stores, was Rs. 58,71,000/-, as compared with Rs. 51,00,000/- for May, 1935, and of exports Rs. 35,81,000/-, as compared with Rs. 32,18,000/-.

The total value of both imports and exports together was Rs. 94,52,000/-, as compared with Rs. 83,18,000/- for the corresponding month last year.

Imports during the month were above those for May, 1935, in the case of coffee, grain, pulse and flour, raw hides, seeds, raw skins, sugar and grey piece-goods; and below, in the case

TRADE OF THE PORT.

Article.	Unit	Imports		Exports	
		Quantity.	Value Rs.	Quantity.	Value Rs.
Coal ...	Tons	10,960	1,98,113	3	63
Coffee ...	Cwts.	7,051	1,95,481	7,181	2,30,271
Grain, Pulse and Flour ...	"	67,555	3,99,398	58,833	2,97,315
Gums and Resins ...	"	3,562	63,502	2,583	61,463
Hardware ...	"	0	24,528	0	24,792
Hides, raw ...	No.	9,667	11,008	6,226	11,333
Oil, Fuel ...	Tons	60,121	14,06,021	0	0
" Kerosene ...	Gls.	4,040	2,533	4,780	3,075
" Petrol ...	"	3,400	3,410	6,620	9,780
Salt ...	Tons	0	0	47,450	4,88,700
Seeds ...	Cwts.	9,334	76,704	2,374	14,480
Skins, raw ...	No.	415,233	2,18,712	438,399	4,50,732
Sugar ...	Cwts.	49,881	2,45,287	33,793	1,66,896
Textiles—					
Piece Goods, Grey ...	Yds.	3,300,248	4,20,190	1,576,680	1,92,556
" " White ...	"	1,024,043	1,60,481	469,675	73,703
" " Printed or Dyed ...	"	1,523,744	2,34,608	1,409,603	3,03,829
Twist and Yarn ...	Lbs.	84,800	38,100	68,559	29,093
Tobacco, Unmanufactured ...	"	367,864	81,551	550,116	1,01,058
" Manufactured ...	"	56,224	67,043	46,504	47,361
Other Articles ...	No. of Pkges.	71,471	14,94,174	27,275	6,58,166
Treasure, Private ...	—	0	4,80,848	0	4,16,035
Total ...	—	—	58,71,692	—	35,80,701

The number of merchant vessels over 200 tons that used the port in May, 1936, was 129, as compared with 146 in the corresponding month last year, and the total tonnage was 529,000, as compared with 634,000.

Excluding coal, salt, fuel oil and Military and Naval Stores and transshipment cargo, the total tonnage of imports in the month was 12,300 and of exports 8,500, as compared with 10,800 and 6,400 respectively for the corresponding month last year.

of gums and resins, hardware, white and printed or dyed piece-goods, twist and yarn, unmanufactured and manufactured tobacco, and private treasure.

Exports were above those for May, 1935, in the case of coffee, grain, pulse and flour, raw hides, seeds, sugar, white and printed or dyed piece-goods, unmanufactured and manufactured tobacco; and below, in the case of gums and resins, hardware, raw skins, grey piece-goods, twist and yarn, and private treasure.

A.C. Motors and Control Gear

Brook Motors, Ltd., Empress Works, Huddersfield, have recently published a very interesting and informative book dealing with alternating current electric motors and control gear. The book, which is published at 1s. and comprises 128 pages, gives the fullest details for the installation and maintenance of electric motors in general and Brook motors in particular.

The first few pages of the book describe and illustrate the construction of a Brook motor, and this is followed by some very interesting details and formulæ which enable one to arrive at the necessary horse-power required to drive various machines. Details are given for cranes, pumping motors, machine tools, etc.

Included in the book is an extract from the British Standard Specification for the electrical performance of industrial electric motors and generators with Class "A" insulation, and also extracts from regulations for the electrical equipment of buildings. Details are also given of belt-power transmission, fuse wires, current carrying capacities of insulated copper conductors, full-load currents for alternating current motors, condenser capacity for power factor improvement, efficiency and power factor of A.C. motors, relative performance of Brook A.C. motors, rotor volts and amps of Brook slip ring motors, specification and types of Brook electric motors, motor maintenance and running instructions, general specification of Brook control gear, connection diagrams for Brook motors, estimated running cost of A.C. motors, and the voltage-frequency and phase of various electrical authorities. The book is profusely illustrated throughout.

From the foregoing brief review, it will be seen that this handy little book contains a vast amount of information of

interest to engineers in general, and we understand that any of our readers concerned with the installation, use, maintenance or purchase of motors can obtain this book free of charge, by writing to Brook Motors, Ltd.

Port of London Notes

London's Shipping.

During the week ended 26th June, 1,470 vessels, representing 1,148,732 net register tons, used the Port of London. Of these 552 vessels (905,233 net register tons) were to and from Empire and foreign ports and 918 vessels (243,499 net register tons) were engaged in coastwise traffic.

During the week ended 3rd July, 1,006 vessels, representing 1,019,298 net register tons, used the Port of London. Of these 551 vessels (833,205 net register tons) were to and from Empire and foreign ports and 455 vessels (186,093 net register tons) were engaged in coastwise traffic.

During the week ended 10th July, 1,241 vessels, representing 1,190,032 net register tons, used the Port of London. Of these 558 vessels (875,676 net register tons) were to and from Empire and foreign ports, and 683 vessels (314,356 net register tons) were engaged in coastwise traffic.

During the week ended 17th July, 1,177 vessels, representing 968,362 net register tons, used the Port of London. Of these 523 vessels (765,613 net register tons) were to and from Empire and foreign ports, and 654 vessels (202,749 net register tons) were engaged in coastwise traffic.



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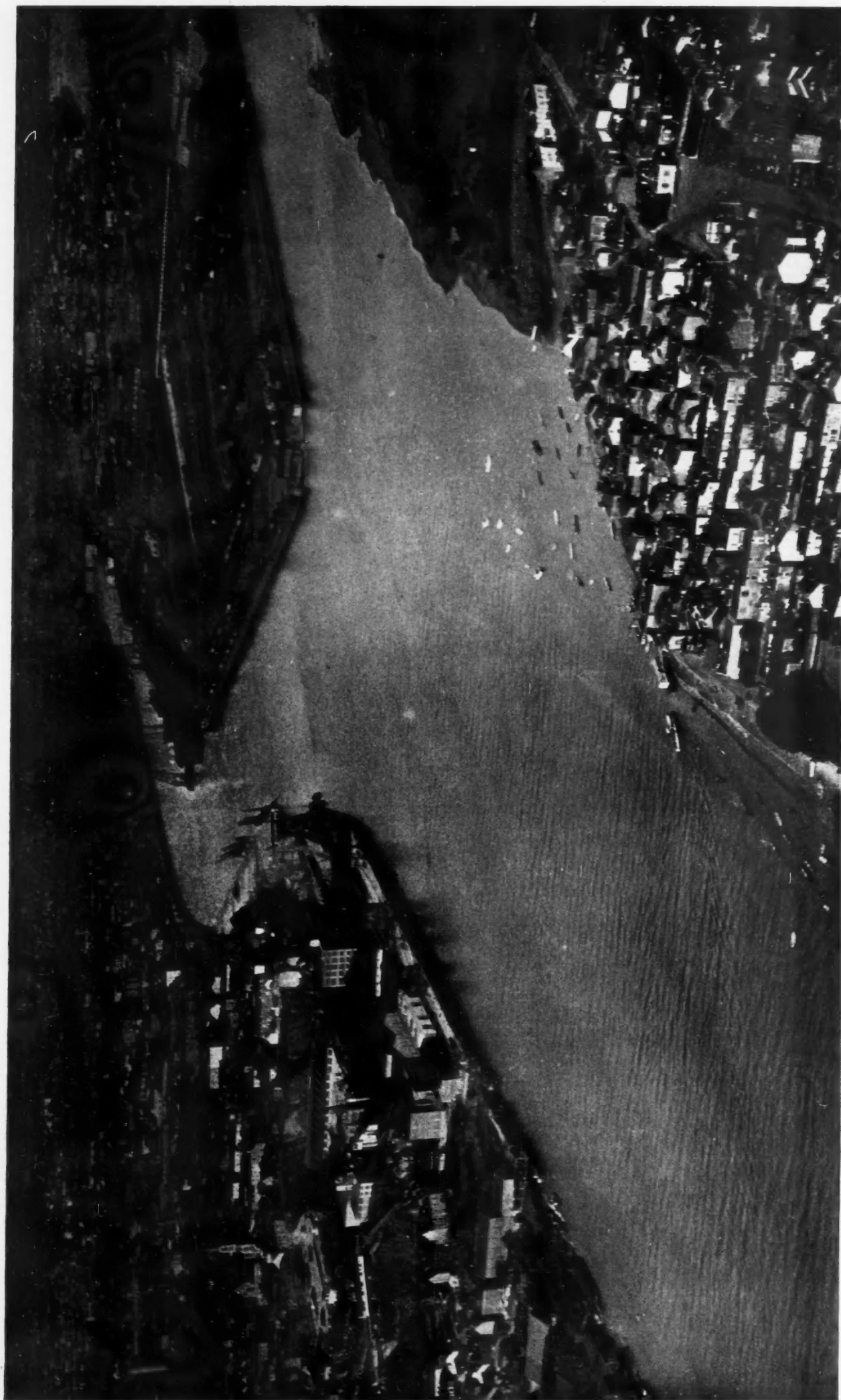
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General View of the Port of Nantes.

The Ports of the Lower Loire, France

I—Historical

THERE was formerly only one seaport on the Loire, the Port of Nantes.

To-day a number of ports, great and small, are spaced along the river from Saint-Nazaire to Nantes, and together form an important maritime centre. They are the Ports of Saint-Nazaire, Donges, Paimboeuf, Le Pellerin, Couëron, Basse-Indre, Indret and Nantes.

The Port of Nantes.

On the site now occupied by Nantes there once stood an "oppidum" of the Gauls, a stronghold fortified with the primitive means of defence then employed.

The port was founded in the third century under the Roman Empire. It enjoyed a period of great prosperity in the reign of the Duchess Anne (1476-1514): it was at this time that the first mooring berths were formed along the river banks.

In the 18th century, when sea-borne trade engaged only sailing ships of shallow draft, Nantes was the focus of a very considerable commerce, especially with the West Indies, and experienced another spell of activity and wealth.

In the 19th century, on account of the general increase in size of shipping, improvement works were undertaken in the waterway in the part marked "endiguée" (embanked), which stretches between Nantes and Le Pellerin.

But it was much more difficult to effect any improvement in the next section, marked "intermédiaire" (middle), which stretches from Le Pellerin to Paimboeuf. This part of the river was encumbered with numerous islands, between which the navigable channel followed a winding course.

Various schemes of amelioration were considered, including a proposal made in 1869 by Chief Engineer Lechalas, which consisted in improving the river bed between Le Pellerin and Paimboeuf. Being judged impracticable at that time, this solution was not accepted, but it was decided instead to construct a ship canal about 15 kilometres ($9\frac{1}{2}$ miles) long, along the left bank of the river, between la Martinière and le Carnet, which by-passed the difficult shallows and appreciably improved the means of access to the Port of Nantes.

This canal, declared to be of "public utility" by decree of 8th August, 1879, was opened to traffic on the 1st September, 1892, and its operation brought about, in the course of a few years, a notable increase in the trade of the port, which having fallen to 503,436 tons in 1886, rose to 998,798 tons in 1900.

Simultaneously with these improvements affecting the river, the Port of Nantes itself was remodelled. The inclined landing stages established along the Fosse, on the right bank, which up to the middle of the 19th century had constituted the main accommodation in the port, were replaced in the period 1873 to 1886 by vertical-faced quays, suitable for steamers to be moored alongside. From 1892 to 1894 the timber wharves of the St. Louis Quay were constructed to cope with the augmentation of traffic. Later, lacking further space on the right bank, the left bank was developed by the construction in 1897-1899 of the timber wharves of the Fernand Crouan Quay, and in 1900-1904 those of the West India Quay.



Port of Nantes—6-ton Cranes on the Wilson Quay.

But the continued increase in draft of vessels and the difficulties attending the navigation of the canal, especially the loss of a tide by all vessels using it, led to the abandonment of the canal and the revival of the Lechalas project, rendered possible by reason of the immense progress made in the construction of dredging plant.

This new project of improvement of the river itself, in the "middle section" lying between Le Pellerin and Paimboeuf, was prepared in 1901 and declared of "public utility" by decree of 24th December, 1903. These works, consisting in the construction of longitudinal embankments and in dredging, are now nearly completed.

The project having quickly made an appreciable difference, in enabling vessels of increasing draft to get up to Nantes, it became necessary at the same time to increase the length of quays, the depth of water alongside them, the extent of storage grounds and the superficial area of sheds.

An extensive programme, carried out between 1904 and 1913, comprised:—

- (1) Widening, by means of reinforced concrete false-quays, the La Fosse and Ernest Renaud Quays, and lowering the bottom there by rock-breaking and dredging;
- (2) Construction of the "Dubochet" Store, a new warehouse of the Chamber of Commerce;
- (3) Construction of sheds at the La Fosse and West India Quays;
- (4) Formation of reinforced concrete wharves at the Cordon Bleu and Roche-Maurice Quays;

Subsequently the decree of 7th July, 1913, declared as of "public utility" a further programme, in two parts:—

The first of these aimed at extending the port accommodation and included:—

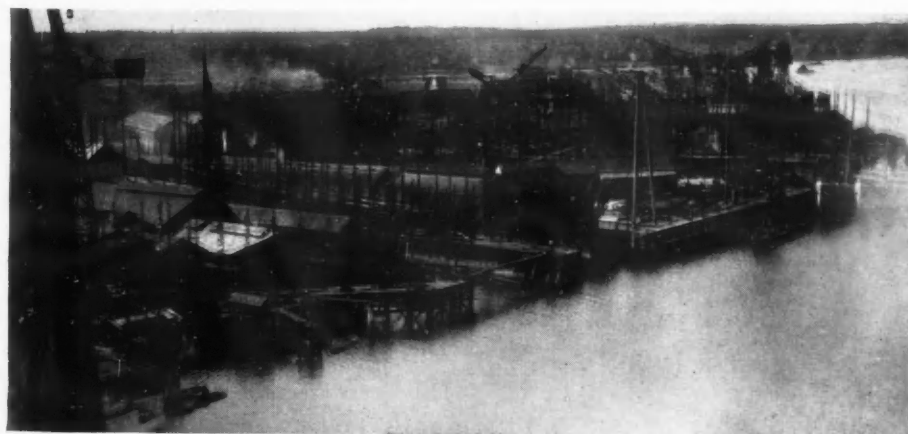
Construction, on the left bank (Pirmil branch) of 1,554 metres (1,700 yards) of new quayage, which was commenced in 1914 and completed in 1929;

Renewal in reinforced concrete, between 1922 and 1927, of the old timber wharves at the St. Louis, Fernand Crouan and West India Quays.

The second part had the purpose of facilitating the rise of the flood tide above the port, in order to increase the natural scour by ebb and flow in the navigable channel. This included:

Demolition of road bridges at La Madeleine and at Pirmil and of the railway bridge on the Nantes-Pornic line, whose massive foundations obstructed the tidal flow, and their replacement by modern bridges having ample water-way.

Improvement of the river bed above the port, between Nantes and



Naval Shipyards, Port of Nantes.

Ports of the Lower Loire—continued

Oudon, the effective sections being increased and suitably controlled by means of spurs or groynes.

A decree of 26th July, 1933, declared the creation of a new channel between Paimboeuf and the sea to be of "public utility." This new channel, which is located in the concave curve of the North bank, between Donges and St. Nazaire, will improve the regime of the river at its mouth by harmonising the tidal action of the flood and ebb. It will allow the largest tankers to reach Donges.

The Port of Nantes includes a river section, whose prosperity has for a long time been linked with that of the maritime section.

River navigation on the Loire above Nantes was very active at one time, and went up as far as Orleans. But the progressive siltation of the river and especially the competition of the railways brought about a great decline in such navigation, and in 1900 it had practically ceased. A decree of 20th December, 1903, ordained the creation of a navigable section, as an experiment, for 14 kilometres between the Maine and Chalonnes. The works were extended in stages up to Oudon, 24 kilometres from Nantes. The decree of 7th July, 1913, already mentioned, sanctioned the improvement of this 24-kilometre length, between Oudon and Nantes, under the description of a "tidal basin."

The volume of water impounded at every tide above the Port of Nantes and capable of useful service in automatically deepening the channel in and below the port would be increased by these river works. The expected results were, in fact, attained: the tide now rises to Oudon, 80 kilometres (50 miles) above St. Nazaire, and there is a regular channel between Nantes and the mouth of the Maine, with a minimum depth of 1.2 metres (4 feet) below mean low water.

Navigation on the River Erdre, which enters the Loire at Nantes, hardly began until 1830, when the canal from Nantes to Brest was opened and the Erdre was canalised. Traffic is now tending to increase, owing to the employment of motor barges.

The Port of St. Nazaire.

Before 1800 no marine works existed. A community of 80 families was settled upon a rocky promontory of low elevation, and the site where the docks now are was covered with a deep bed of mud overlying the rock, its surface varying in level but in general lying fairly high. The roadstead developing to the South and East of the port was frequented by ships going up the Loire or laying by, some of them even discharging part cargo into lighters there to reduce their draft. It was at this time, in 1802, that the Consular Government called for a scheme to be drawn up for the construction in the Loire estuary of a dock suitable for the building of two vessels. The bay of St. Nazaire was selected by the engineers as a suitable site, but the project was not carried out. Nevertheless, the attention of the Administration was in this way drawn to the place, and in 1808 St. Nazaire was indicated as the only point where a great mercantile marine establishment could be founded, by reason of the difficulties which at that time attended the passage up the Loire of any but small vessels.



The Penhoet Dock and the exit from the Port of St. Nazaire by way of the Lock-Drydock.



The Lock-Drydock, Port of St. Nazaire, with the liner "Normandie" docked.

Yet it was only the need of providing landing facilities for boats from ships anchoring in the roads, and that of assisting the movements of passengers who chose to travel by water to and from Nantes, that brought into being in 1831-1835 the first marine work: a very modest protective breakwater, with landing stages, a work which is still in existence, and is called the "Old Jetty."

Immediately afterwards further needs were felt. The difficulties of navigation in the Loire continued to increase: it was decided to create a commercial port at St. Nazaire. A wet dock of 10 hectares (25 acres), with an entrance facing the East, comprising two locks, one of them having a chamber, was opened to traffic in 1856 and called the "Bassin de Saint-Nazaire," or St. Nazaire Dock. This was a complete success, and the formation of a second dock was decided upon. The construction works lasted from 1862 to 1881: the lock connecting the two docks did service provisionally as a graving dock for repairing the new steamers of the West India line, which had been inaugurated in 1862 by the *Campagne Générale Transatlantique*.

Simultaneously with the construction of this second basin, called the "Penhoet Dock," were built three graving docks, and these are still in use.

To apply the same standard to the depth of moorings in the port as to those realised by dredging in the approach channels, the St. Nazaire Dock was deepened some years later. But the port did not yet have facilities for docking ships of more than 13 metres (42½ ft.) in beam and 50 metres (164 ft.) in length: so it was determined to provide the port with a new entrance, lying North and South, comprising a lock 30 metres (98 ft.) in width and 211 metres (692 ft.) in effective length, an outer basin between converging jetties and a tidal quay or floating stage moored to one of these jetties. These works were brought into use in 1907.

In 1913, the West quays of the Penhoet Dock were completed. Finally, while the yards of St. Nazaire laid down the liner "Normandie" on the stocks, a third entrance, designed to serve also as a graving dock, was formed in 1928-1932. This will pass or dock the biggest ships afloat, and its dimensions—350 metres (1,148 ft.) effective length and 50 metres (164 ft.) effective width—make ample allowance for the future. It was supplemented by a lying-up berth in front of the fitting-out quay at the shipyard and connected with the East quays of the dock by a quay wall supported upon long piles.

The Small Ports of the Lower Loire.

On the right bank, moving in a downstream direction, one reaches in succession:

The port of BASSE INDRE (the Lower Indre) which was formed up to 1844 only by the natural bank of the Loire; along the face of which, by private owners, stone landing stages running down to low-water level had been established.

Until the beginning of the 19th century, the population was composed entirely of fisherfolk. The installation of the first iron-works about that time and of the Indret Works at Basse Indre about the middle of the century was to bring to the place a large number of workpeople.

THE PORTS OF NANTES & ST NAZAIRE.

UNDER THE JURISDICTION OF THE MINISTRY OF PUBLIC WORKS, PARIS.

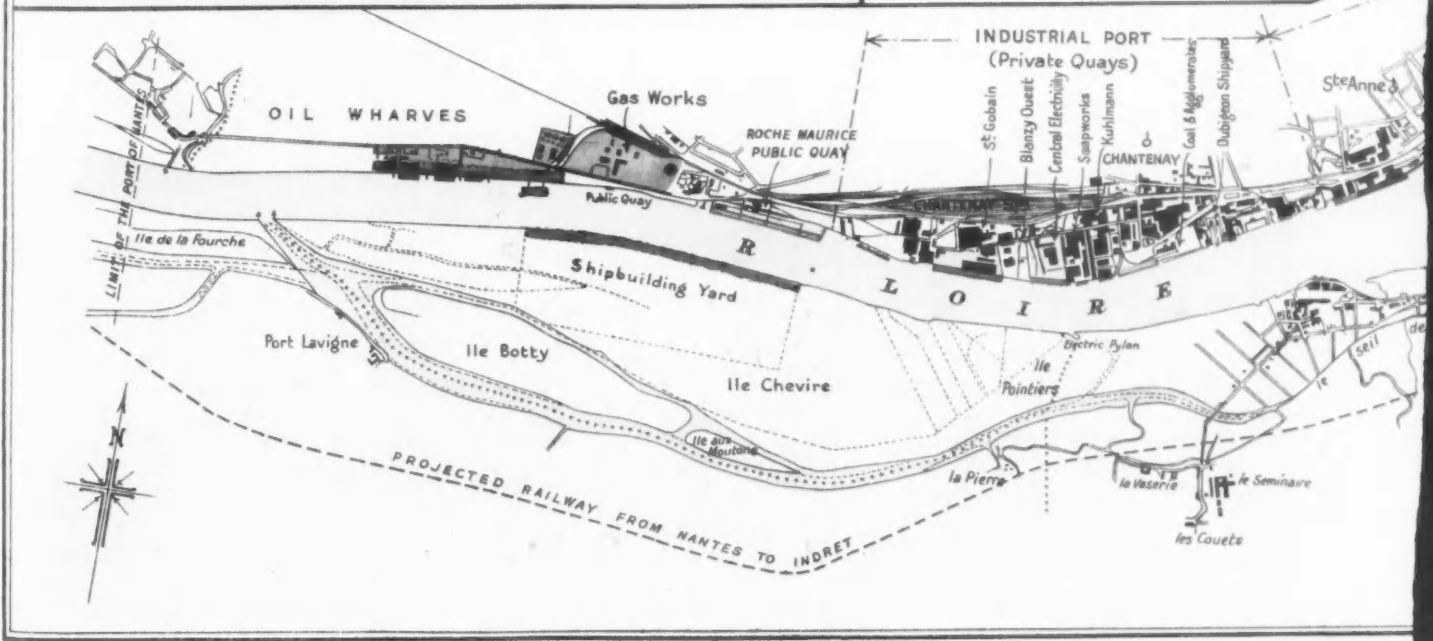
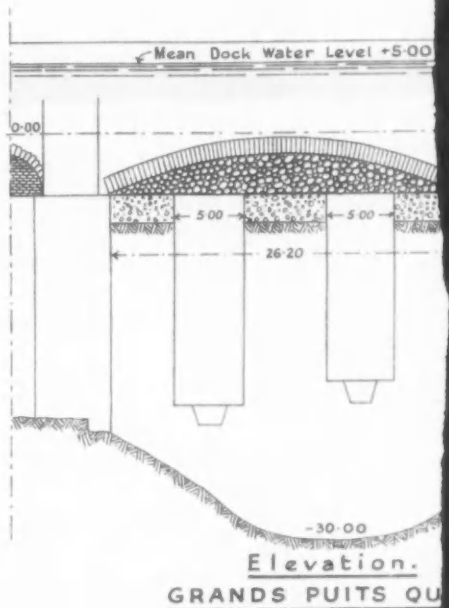
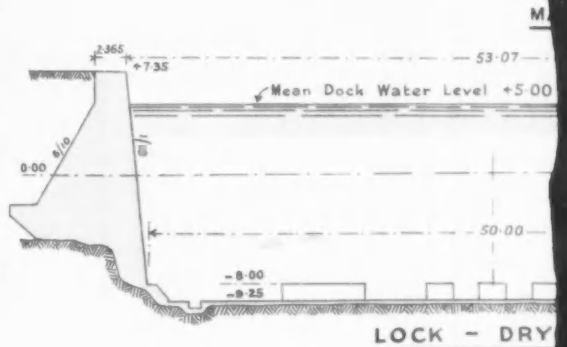


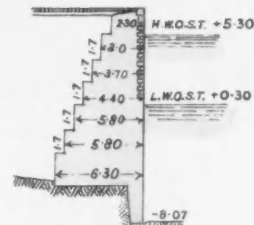
REFERENCE

- Before 1825
- From 1831 to 1835
- From 1837 to 1856
- From 1857 to 1881
- From 1896 to 1906
- From 1908 to 1918
- 1913
- From 1929 to 1932

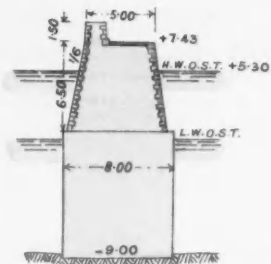


SAINT-NAZAIRE

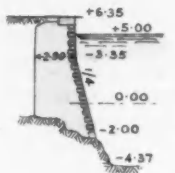




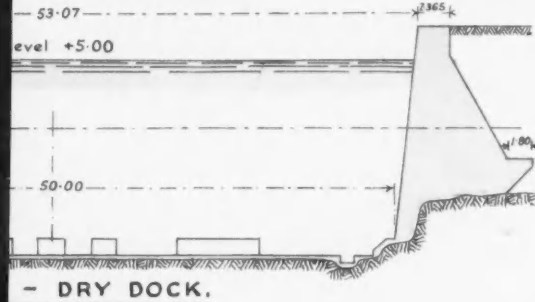
MAREE QUAY.



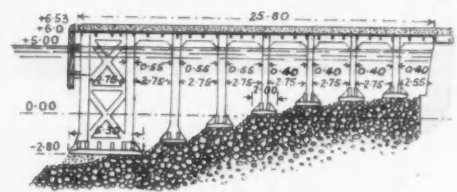
JETTIES.



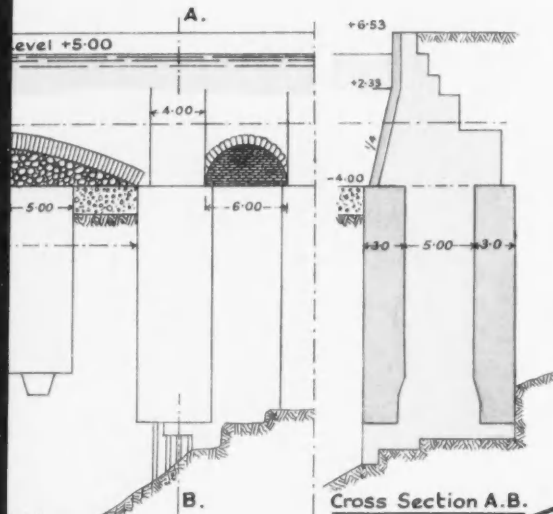
DEMANGE QUAY.



- DRY DOCK.



DARSE QUAY.

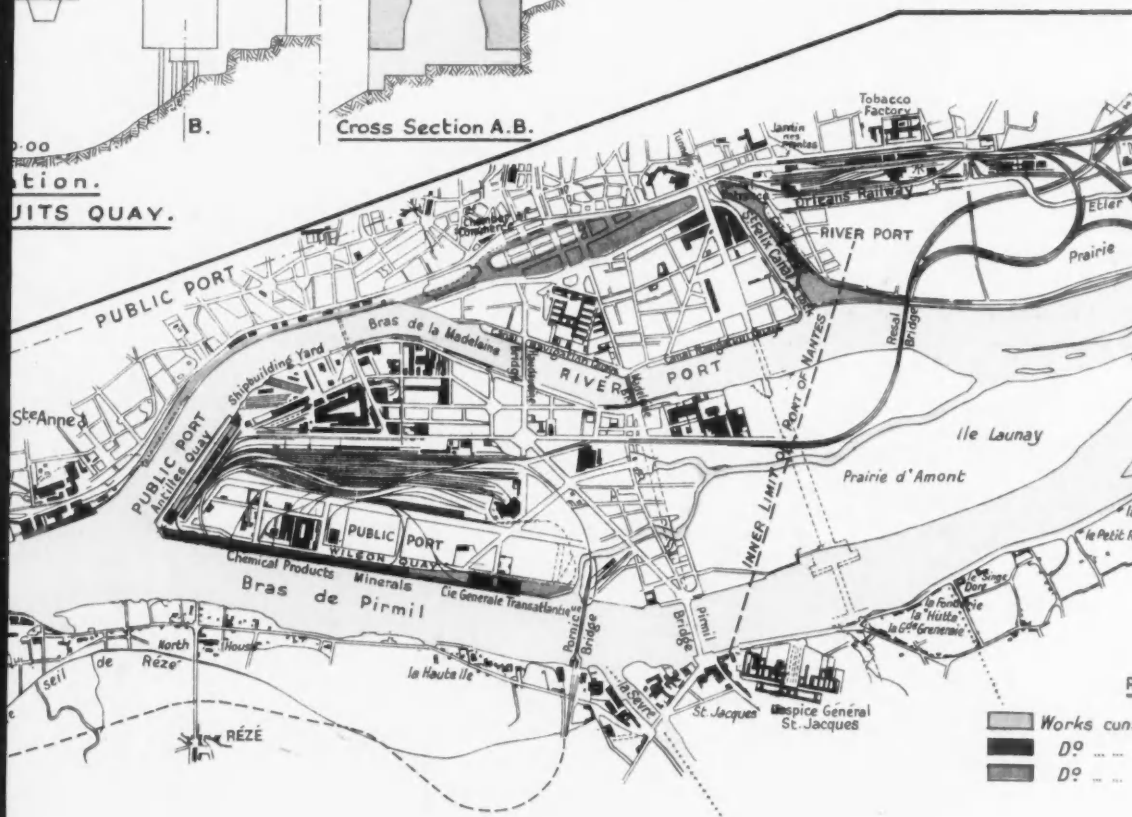


QUAYS QUAY.

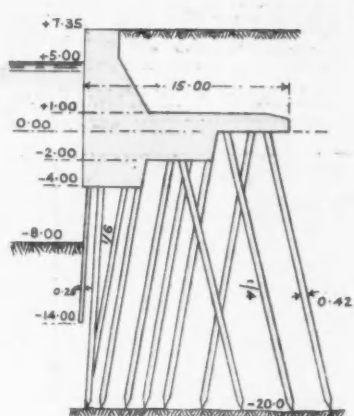
PORT OF ST NAZAI

TYPES OF QUAY WALLS.

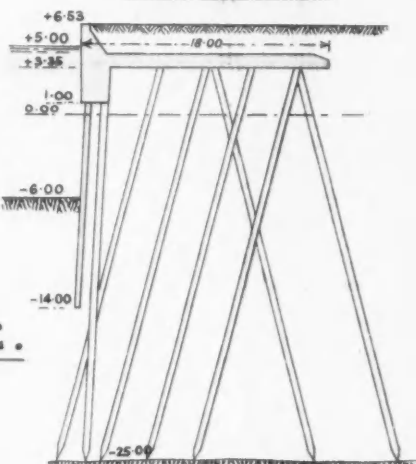
Scale for Sections.



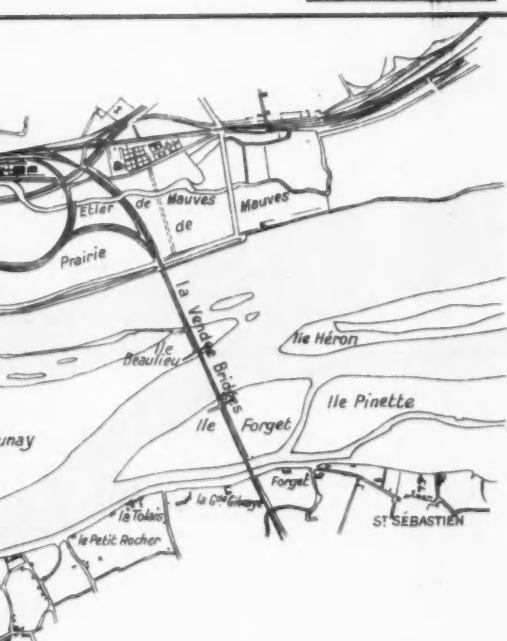
PORT OF



PRISE D'EAU QUAY.
Strengthened Section.



PRISE D'EAU QUAY.
Normal Section.



REFERENCE.

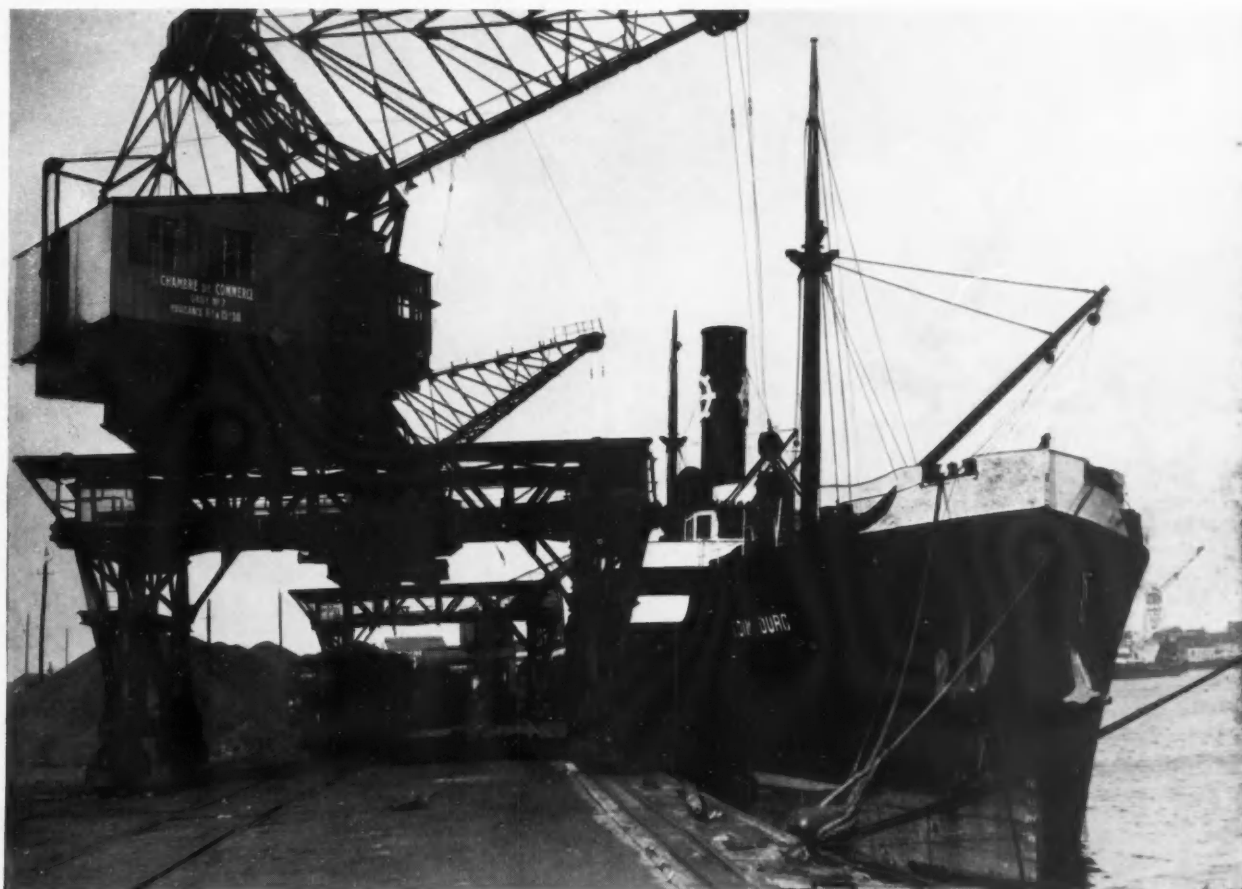
Works constructed from 1903 to 1914.
 D° 1914 to 1924.
 D° 1924 to 1935.

O F N A N T E S .

The Ports of the Lower Loire, France



General View of the Port of St. Nazaire, from the Inner End of the Penhoet Dock.



Ship discharging Coal with 6-ton Cranes, Port of St. Nazaire.

Ports of the Lower Loire—continued*Outer Basin and South Entrance, Port of St. Nazaire.*

From 1844 onwards landing stages and slipways were constructed, to a total length of 1,400 metres (1,530 yards). Finally, in 1928, were built the wharves of the Indret Iron-works and of the Bordeaux Chemical Products Company.

The port of COUERON, which must be of very early origin, since it was mentioned by Strabo as the principal landing place of the Namnetes at the time of the conquest of Gaul, became in the 18th century the out-port of Nantes. Before 1837, there was no artificial quay in existence. The reclamation of land and building of quays was begun in 1843. A lead foundry was established in 1860. The present wharves were built in 1919.

The port of DONGES: The importance of this place as a port was negligible until 1917. There was nothing but a mooring jetty for the reach of river from Paimboeuf to Donges. The construction of Donges Wharf was decided upon on 27th January, 1917, to relieve the port of St. Nazaire, which was to be specially devoted to the needs of the American army. An order of 2nd August, 1917, authorised the Orleans Company to instal, under the terms of its Concession, the mechanical-handling plant and the railways necessary. A staging of 350 metres (1,150 feet) in length with the necessary equipment and railway connections was constructed and completed several years after the War. The port was to have been a coaling station, but in 1929 the Orleans Company gave up its Concession.

A Petroleum Company established itself at Donges in 1920, and used, for the accommodation of oil tankers, the wharf that had been intended for colliers and especially a new mooring berth at dolphins, constructed by the company in 1922. Eventually a distillery and then an oil refinery were laid down in 1931 and 1934. The traffic in petroleum products in 1935 amounted to 204,458 tons, imports and exports together.

On the left bank, leaving Nantes, one comes to a mechanical engineering works at INDRET, where there are wharves and dolphin berths.

The port of PELLERIN, where the earliest works were executed in the middle of the 19th century.

The port of PAIMBOEUF, which, before the 17th century, was no more than a small hamlet of a few fishermen, but was the outport of Nantes during the whole of the 18th century and until the St. Nazaire Dock was created. A wet dock project here was considered as an alternative to that at St. Nazaire, but abandoned in its favour. A graving dock was put into service in 1862. A vertical-faced quay, 200 metres in length, was undertaken in 1878. Finally, wharves were built in 1917 for the important chemical industry of traffic in superphosphates.

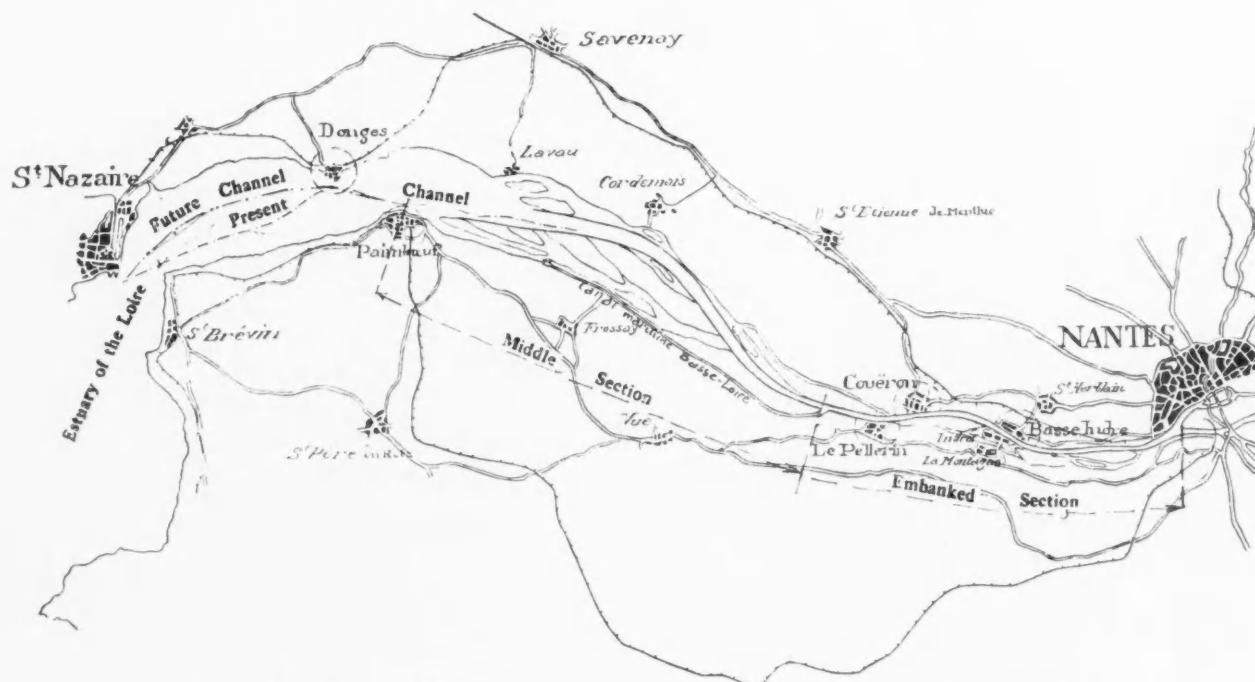
II—Administrative Organisation

The ports of Nantes, St. Nazaire and their subsidiaries—consisting in the smaller ports along the river—are administered directly by the State.

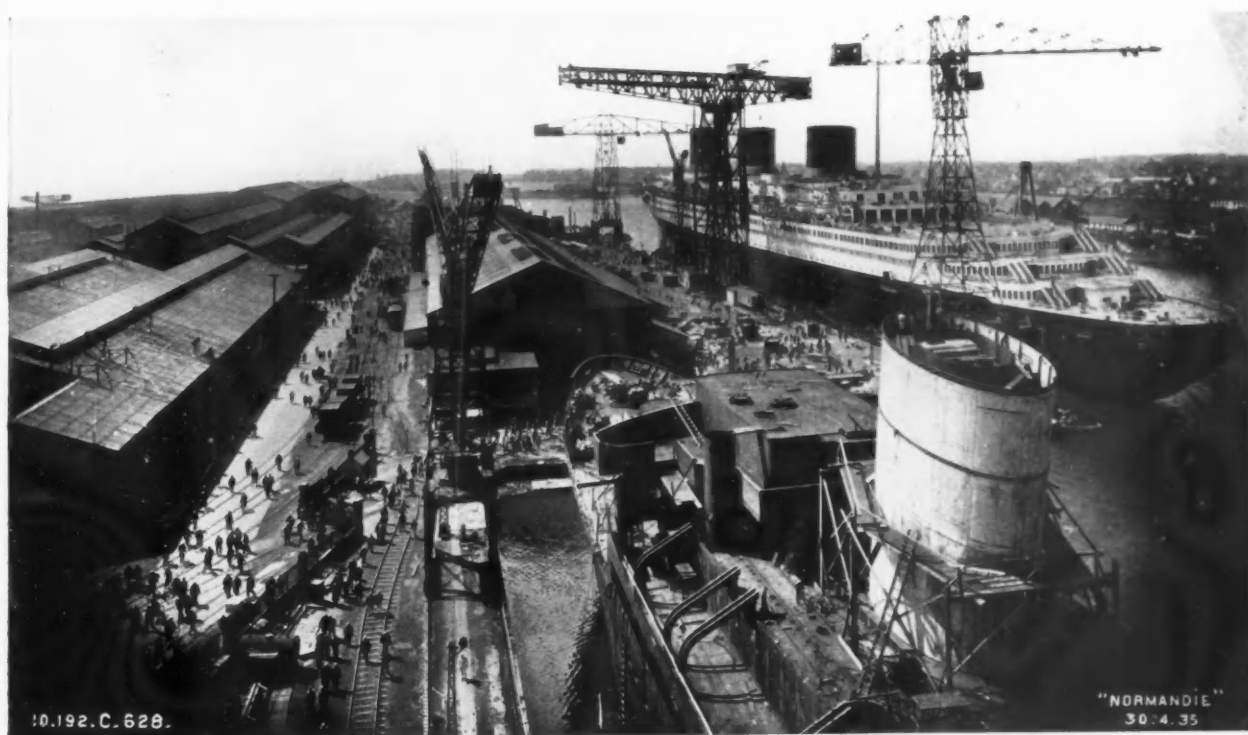
The general or public equipment, and the use of the dry docks and floating dock, are entrusted to the Nantes and St. Nazaire Chambers of Commerce.

An Advisory Commission was set up by ministerial order of 7th April, 1924, to deal with questions affecting both the large ports.

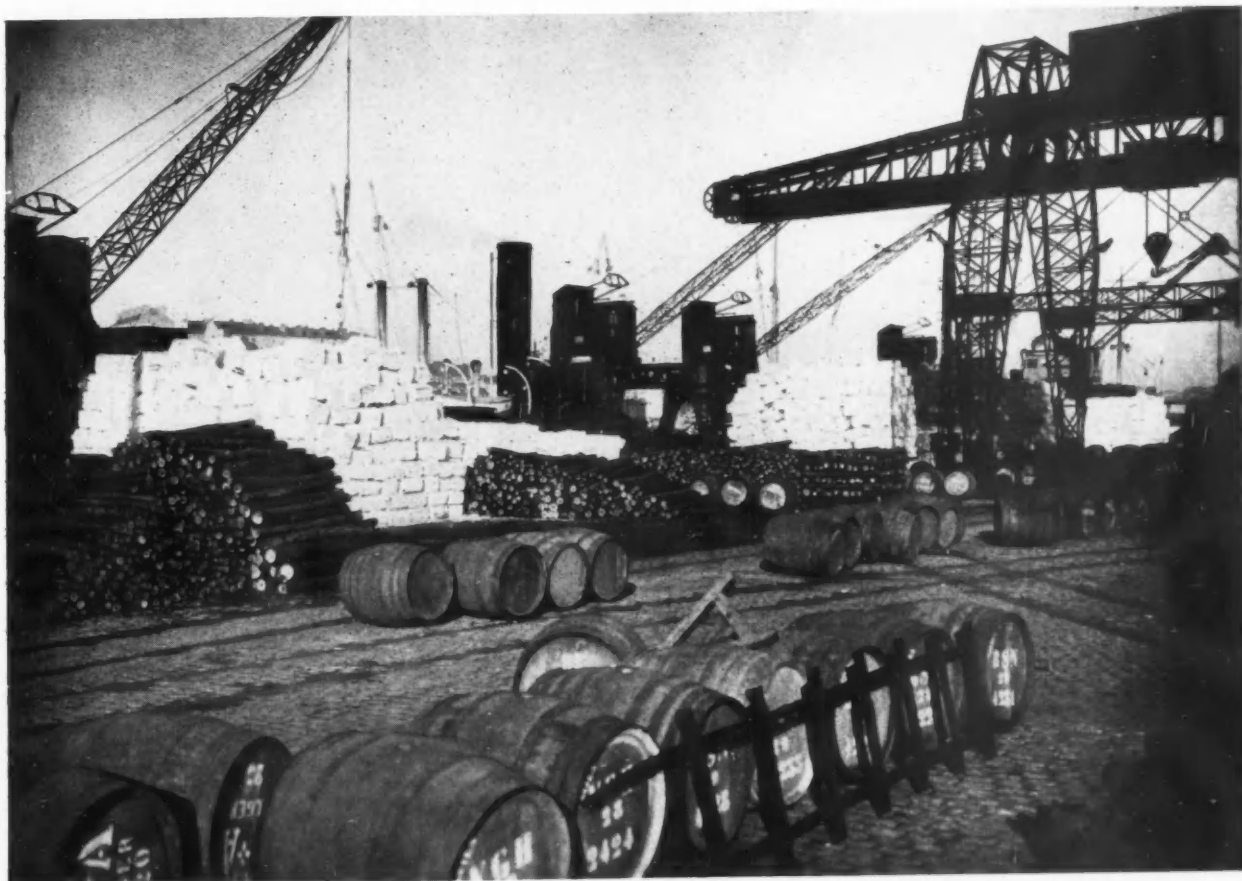
Ultimately the location of Nantes and St. Nazaire on the same waterway, their relationship with the same hinterland and their common interests led the Government to link them under the authority of a single director, by decision of the 1st August, 1934.

*Approaches to the Port of Nantes. The Small Ports of the Lower Loire and the Navigable Channel.*

The Ports of the Lower Loire, France



Fitting Berths of the Penhoet Shipyard, Port of St. Nazaire, with the "Normandie" alongside.



General Cargo Dumps, West India Quay, Port of Nantes.

Ports of the Lower Loire—continued

III—Present Condition of the Ports, their Approaches, their Works, their Equipment and Means of Despatch.

1—General Description

The Port of St. Nazaire.

The port of St. Nazaire is situated in latitude of $47^{\circ} 16'$ North and longitude $2^{\circ} 12'$ West (of Greenwich), on the right bank of the Loire at the point where the river estuary widens out to the sea. The port comprises two wet docks, placed end-to-end and governed by three entrance locks, the direction of their common axis being N.N.E. The tidal rise is 5.80 metres and 3.90 metres, at springs and neaps, low water being respectively at 0.10 below and 1.80 above zero of charts. The strongest winds are from the S.W.

The Port of Nantes.

The port of Nantes is situated on the Loire at 56 kilometres (35 miles) from its mouth. The river, which is its only way of approach by water, traverses the town from East to West in two branches, the Northern or Madeleine Branch and the Southern or Pirmil Branch.

The port of Nantes comprises only riverside installations, having a total area of 40 hectares (100 acres), of which 25 hectares (62 acres) form the maritime section extending below the bridges along both banks of the Madeleine branch and the right bank of the Pirmil branch. The river port extends through the town along both banks of the Erdre and the two branches of the Loire above the bridges.

The port is in communication with the interior of the country by way of the Loire and the canal from Nantes to Brest, which respectively give access to Angers, le Mans and Laval on the one hand and to Rennes and St. Malo on the other. Its railway connections, which are particularly favourable, place it in direct communication, by very profitable lines, with Angers and Tours, Rennes and Brittany, la Roche-sur-Yon, Niort, etc. The hinterland of the port of Nantes includes the whole of Brittany, the Loire valley up to Tours and Orleans, the Vendée, the two Sèvres and Mayenne.

The Small Ports.

Between Nantes and the sea, the Loire traverses a highly developed industrial region, which includes what are known as the small ports of the Lower Loire. These are:—

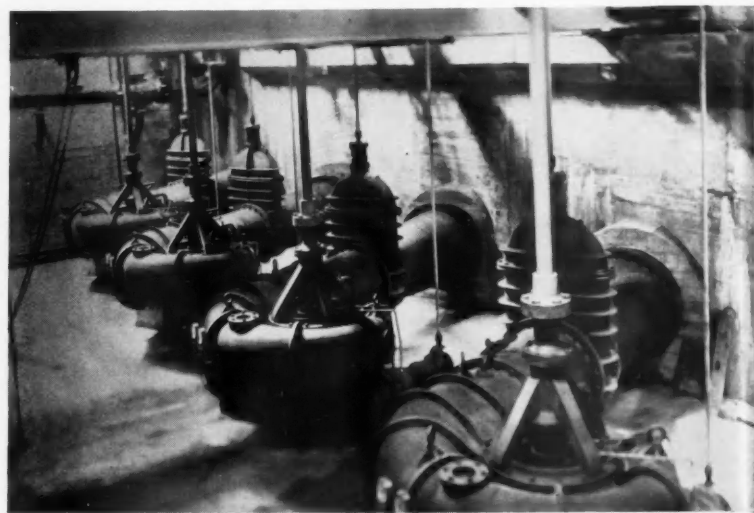
On the right bank:

BASSE INDRE, with the wharves of the Bordeaux Chemical Company and of the Basse Indre Iron and Steel Works.
COUERON, with the Pontgibaud Lead Works.

DONGES, with the jetty comprising three berths for the discharge of crude oil for the Petroleum-users' Distillery and the Refinery at West Pêchebronn. Here also are the mooring berths for the oil tankers of the Western Petroleum Products Company.

On the left bank:

INDRET: Opposite to Basse Indre, at Indret, is a mechanical engineering works, a centre for research and construction



Pumping Station at the Lock-Drydock, Port of St. Nazaire—Pump Room.

of propelling machinery for all classes of vessels. This factory has 75 metres length of wharf and two dolphins, providing two 100-metre berths, and is equipped with a 6-ton crane and an 80-ton Titan.

LE PELLERIN, serving for traffic in forage.

PAIMBOEUF, with the jetty of the phosphate works and a public quay.

All these small ports, constituting "Annexes" to the port of Nantes, have a considerable trade, which in 1935 amounted to 483,960 tons.

2—Approaches

Channels.

A channel four miles in length carries shipping from the sea to the roads at St. Nazaire, of which the most important extends over 13.0 hectares (320 acres), with a minimum depth of 10 metres, and has an excellent bottom for anchorage.

This channel goes through the sandbanks by the passage known as the Carpenters' pass, a straight channel more than a mile long, and reaches the principal roadstead at St. Nazaire by a curved channel following round the shore, and called the "Bonne Anse" (or Fair Bay) channel.

The straight passage was formed artificially by dredging through the banks, whose natural depth of about 3 metres was quite insufficient for the navigation of vessels. A depth of 5 metres was attained for a width of 200 metres in 1907. A fresh improvement programme provided for lowering the channel bottom to a depth of 7 metres, but until the summer of 1934 it had not been carried out. It was eventually undertaken and brought into effect during the winter of 1934-1935, in view of the sailing of the liner "Normandie." These works, executed in the seven winter months from October 1934 to May, 1935, by the two trailing suction dredgers of the Port of Bordeaux, involved the removal of more than 4,000,000 cubic metres of sand (measured in hopper) representing an increase of depth to 9 metres on the centre line and 7 metres throughout a width of 150 to 200 metres in the Carpenters' Passage. At the same time the curved channel Bonne Anse, which—while deep enough—had been too narrow, had its width (at 7 metre depth) increased from 150 to 250 metres.

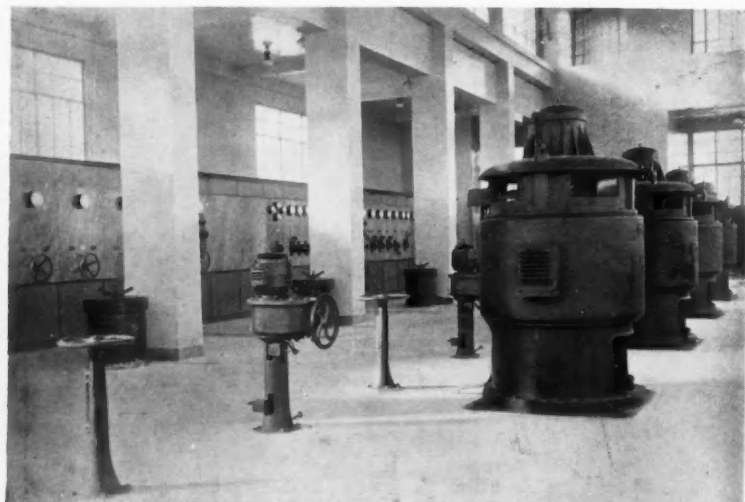
It is intended in future to improve these approach channels along a new alignment, with the object of reducing, as much as possible, the volume of the annual maintenance dredging required. Under the conditions that existed prior to 1935, the yearly quantity approached 250,000 cubic metres (hopper measurement) of dredged material. The future channel will have to follow a line along which the ebb and flow of the tide will operate uniformly, and to make connection with the channel which is in course of formation between Paimboeuf and St. Nazaire, which will be described presently.

The maritime Loire itself comprises three parts, which all have different characteristics:

(i) The downstream part, forming the estuary proper, from St. Nazaire to Paimboeuf, for a length of 15 kilometres.

(ii) The central or intermediate part, 22 kilometres long, between Paimboeuf and le Pellerin.

(iii) The part described as dyked, 19 kilometres long, between le Pellerin and Nantes.



Pumping Station at the Lock-Drydock, Port of St. Nazaire—Motor Room.

Ports of the Lower Loire—continued



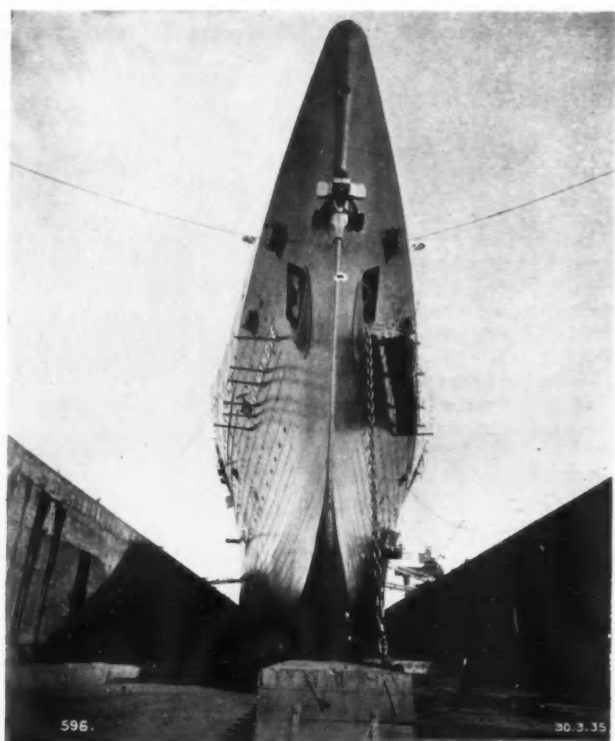
Lock on St. Felix Canal, Nantes.

The downstream section, for 15 kilometres below Paimboeuf, had no special work done in it until recently. Yet, while it had sufficient water, affording a minimum depth of 4.8 metres below zero to vessels going up to Donges, the channel followed by navigation was of unsuitable outline and did not make the best use of the tidal currents. Also its course was changeable.

To remedy this state of affairs and to obviate the troubles which would have arisen from the eventual shifting of the channel, a project was drawn up for forming a new channel between Paimboeuf and St. Nazaire which in the first instance should be 5 kilometres long and 100 metres wide. The cost was estimated at 60 million francs, and the scheme was declared as of "public utility" by ministerial order of 26th July, 1933. The works have been put in hand and have already resulted in the formation, to the North of the future channel, of three spurs composed of material dredged and deposited.

Including the quantity derived from the digging of an experimental or pilot channel begun in 1929, the spoil dredged up to 31st December, 1935, amounted to 2,121,029 cubic metres, measured in hopper. The length already executed maintains its depth naturally, and moreover the lower part of it is deepening under the influence of the tidal currents.

Above Paimboeuf, the considerable improvements resulting from the works authorised by the decree of 24th December, 1903, have been carried further by important supplementary works, consisting in the closure of a number of dead branches of the river, in the dredging of bars that resisted erosion by tidal scour and in the formation of spurs to reduce excessive width in certain places. These various operations have been undertaken and are to be completed within the next few years, bringing the total expenditure under the decree of December, 1903, up to 50 million francs.



Docking of the liner "Normandie," Port of St. Nazaire.

The width of the middle or "intermediate" section increases gradually from 300 metres at le Pellerin to 900 metres below Paimboeuf.

The first section below Nantes, called the "dyked" or embanked section, has a width of about 200 metres on leaving the port, increasing to 300 metres below la Martinière.

At the present time the depth of 3.5 metres below zero of charts obtains throughout the whole of the maritime Loire, including the intermediate section. This allows the passage up to Nantes of vessels drawing less than 6.45 metres during 365 days; from 6.50 to 6.70 metres during 364 days; from 6.75 to 6.95 metres during 338 days; from 7.00 to 7.20 metres during 298 days; from 7.25 to 7.45 metres during 247 days; from 7.50 to 7.75 metres during 198 days; from 7.80 to 7.95 metres during 149 days; more than 8 metres during 119 days.

Tidal Data.

The influence of the tide is appreciable up as far as Oudon bridge, 24 kilometres (15 miles) above Nantes. Above Nantes the range diminishes very quickly, but will be increased by excavation of the work proposed in the so-called "tidal basin."

In the maritime Loire, the low water levels have excessive gradients in the lower reaches. The proposed improvements between Paimboeuf and St. Nazaire should have the effect of removing this anomaly, and, by causing a general deepening of the river bed, bringing about an adjustment to a more regular curve of low water levels.

The prevailing winds come from the West and cause the river water to be held up by raising the level of high tide.

The mean velocities of current observed between Basse Indre and Paimboeuf are, at the period of diminished flow, 50 centimetres per second in neaps and 95 centimetres in spring tides; they are much stronger in times of flood and may then reach 3 metres per second.

The river floods have the effect also of greatly reducing the tidal range in the region of the port; so that in heavy flood the tide is not felt at all at Nantes.

3—Works

Port of St. Nazaire.

(a) QUAYS. The port being founded upon a bed of mud overlying the rock, which is generally at shallow depth, except where it is the former bed of a small tributary of the river, the majority of the artificial works have been carried down to bear directly on the rock, either working "in the dry" within the shelter of cofferdams, as in the case of the docks and entrance locks, or else under compressed air, as for certain parts of the jetties forming the outer basin.

Nevertheless, some of the quays in the Penhoet Dock are founded on piers carried down as monoliths to the rock and others are supported on piles. The Dock Quay, in the centre of the West side of the Penhoet Dock, consists of a reinforced concrete decking carried by piles having wide sole-plates to spread their load. These rest on a foundation provided by the stone pitching which formed the original revetment of the bank when the dock was first excavated. The piles extend about 1½ metres below the sole-plates, in order to give lateral fixity to the whole structure.

The Water Quay ("Prise d'Eau") is connected with the Leek-Drydock by a quay constructed in 1932, and borne by raking piles of the great length of 32 metres or 100 feet, driven through natural soil down to the rock. That part of this quay which forms the connection with the lock has a massive topping wall, capable of bearing the contact of large vessels. The part which forms an extension of it is a mere platform of reinforced concrete, 1 metre thick, carried on piles. In both cases, a curtain wall of reinforced concrete

Ports of the Lower Loire—continued



The Oil Dock, Port of Nantes.

sheet-piling carries down the facing in the plane of the superstructure.

(b) **ENTRANCE LOCKS.** The port has three entrances, whose leading dimensions are given in the sub-joined table:—

Description	Effective Length Metres	Effective Width Metres	Level of Invert
13-metre Lock :			
East Entrance ...	53	13	- 2.17
30-metre Lock :			
South Entrance ...	211 116 77	30	- 6.07
Lock-Drydock :			
East Entrance ...	350	50	- 8.00

The 13-metre lock is used by boats and small shipping; the 30-metre lock, which, having three pairs of gates, can form chambers of 77 m., 116 m. or 211 m. in length, is used by most of the larger vessels; while the lock-drydock gives passage to ships of exceptional size. The curved gates of the 13-metre lock are operated by chains and electric motors; those of the 30-metre lock by chains and hydraulic motors; the lock-drydock is closed by rolling caissons operated electrically.

(c) **RAISING OF WATER LEVEL.** We have seen that the docks have a rock bottom for the greater part of their area, the levels being—4.37 for the St. Nazaire Dock and—1.07 for the Penhoet Dock. Since these levels do not at neap tides give sufficient depth of water for the ships frequenting the port, it was decided, after the construction of the South entrance (the 30-metre lock), to increase their depth. It was found preferable to raise the dock water level by pumping, rather than to lower the bottom by rock breaking, and an impounding station was installed and brought into service in 1911. This station was originally equipped with three sets of steam-driven centrifugal pumps of 350 h.p. each. In 1920 an electrically-driven pump of 400 h.p. was added. The latter is able in practice to maintain the water at its impounded level of +4.50.

(d) **MACHINERY, ETC.** Bridges are provided for crossing over the locks and the passages between the docks.

The 13-metre lock of the East entrance has an electric swing bridge, carrying road and railway. The 30-metre lock

of the South entrance has two bridges: one a double-leaf swing bridge, 4 metres wide, operated hydraulically; the other a rolling bridge, 5½ metres wide between main girders with corbelled footpaths, which also is operated hydraulically. The inner rolling gate of the lock-drydock has a deck of 5-metre width between kerbs. The passage communicating between the docks is crossed by a single-leaf swing bridge of a width of 5½ metres between main girders with corbelled footpaths, operated hydraulically.

(e) **GRAVING DOCKS.** At the inner (North-East) end of the Penhoet Dock there are three drydocks, numbered 1, 2 and 3. These were constructed at the same time as the dock itself, but two of them have been lengthened at different times. These docks are closed by floating caissons of the stepped deck ("pont de ressaut") type.

Their leading dimensions are given in the table below:—

Name of Dock	DIMENSIONS					Levels	
	Normal on blocks	Effective	Entrance at Cope level	Entrance at Sill level	Dock at Cope level	Sills	Blocks
No. 1 Drydock	216	234	35	30	38	-3.37	-2.85
No. 2 Drydock							
1st Section ...	52	61					
2nd " ...	52	51					
Total ...	111	118	13	9.8	16.2	-0.07	-0.23
No. 3 Drydock	116	159	18	14	23	-3.37	-2.83

In addition a fourth dock is provided by the combined lock and drydock already mentioned under the head of Entrance Locks. This structure, 350 metres in effective length by 50 metres in width, provides for the docking and repair of the largest vessels afloat; its central row of keel-blocks is at the level of—8.00, the same as the entrance sills. It is furnished with two 3-ton electric cranes with portals of 9 metres.

Having been begun in 1928, this work was completed in October, 1932, to allow the liner "Normandie" after launching to enter the docks. It is located between the Penhoet Dock and the Loire, near the East entrance to the port; the length between gates serves as a lock chamber, when used for locking vessels in or out, and as a drydock when so used, having five rows of keel-blocks. Being founded entirely on the rock, it has no flooring. The gates roll on two bogie carriages—lower and upper—and are actuated by a fixed winch of 170 h.p. with chain drive. These gates or caissons have double faces, being thus capable of withstanding pressure from either side, according to the relative levels of water outside and inside the docks. They roll back, when opened, into cambers at right-angles with the axis of the drydock; which moreover can be de-watered for examination or repair of the gates. The inner gate carries a roadway, and its camber is covered by a moveable deck, which lifts while the gate is operated.

This lock-drydock is connected, both with the docks at one end and the river at the other, by culverts in the walls, governed by peastocks, four at each end, having an area of 4 square metres each.

De-watering is effected by means of 4 pumps of 350 h.p. each, capable of removing in 7 hours the 180,000 cubic metres that remain in the dock after the water has first been lowered to the level of +1.00 by gravity flow as the tide permits. Two smaller pumps serve for drainage of the dock while a ship is in it. The pumps are placed at a level midway between that of the drydock floor and impounded water level; a hydraulic ejector serves for priming the pumps in case of need.

The works of excavation and building, which were spread over the years 1928 to 1932, were carried out in the dry within the protection of two dams, the one at the North end being formed by a bank of the natural ground left in place and the other at the South end by material filled in between two lines of steel sheet-piling.



Floating Dock at the Port of Nantes.

The Ports of the Lower Loire, France



Rock-breaking and Dredging Plant, Port of St. Nazaire.



Graving Docks, Port of St. Nazaire.

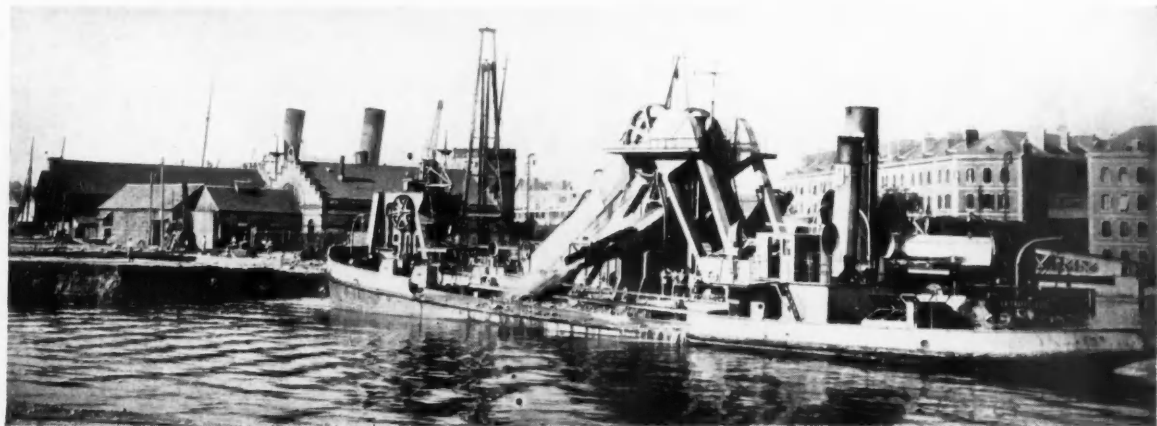


Ernest Renaud Quay, Port of Nantes.

Ports of the Lower Loire—continued

Contingent works included deepening, both in the approach from the river, down to -9.00 , and over an area within the Penhoet Dock intended to form a mooring berth and a turning basin for ships of exceptional draft. A bottom level of -7.00 was given in the berth and -6.00 in the turning circle. These deepening were effected by simple dredging in soft soils, or in the rock by a Lobnitz rock-breaker with 16-ton chisel and under-water guide, followed by dredging. The volume of rock broken and dredged exceeded 65,000 cubic metres, measured *in situ*, and the volume of simple dredging approached 900,000 cubic metres, measured in hopper.

(f) MAINTENANCE DREDGING. The water of the Loire estuary always carries in suspension a good deal of silt, which settles in the outer basin and the docks, so that the maintenance of depth involves the dredging annually of nearly 500,000 cubic metres of material, hopper measurement. The plant engaged in this work includes a bucket-ladder dredger with 550-litre buckets, a hopper dredger fitted with three Priestman grabs, five steam hoppers and a suction dredger of "Fruhling" type which works in the outer basin.



Bucket-Ladder Dredger with 550-litre (over $\frac{1}{2}$ cubic-metre) buckets, at work in the Port of St. Nazaire.

Port of Nantes.

(a) QUAYS: The port of Nantes extends along two branches of the Loire. Before the War the quays had spread along the banks of the North branch only, and principally the right bank of that branch.

The increase of traffic, the inadequacy of obsolete works and the insufficient depth of water alongside them—insufficiency due to the double cause of the increased draft of vessels trading to Nantes and of the lowering of low-water level by improvement of the river bed below Nantes—rendered necessary the reconstruction and improvement of the old quays. These had originally consisted in masonry walls built upon piles driven to rock or founded on artificial blocks in cases where the rock was encountered at shallow depth. The walls on piles had behind them either relieving arches or anchorages.

To afford adequate depth of water alongside, "false quays" either of timber or reinforced concrete were formed in front of the new wharves; the old timber structures having, moreover, been replaced during recent years by reinforced concrete. Quays formed in this way, of an old wall faced by a "false quay" of reinforced concrete on piles driven to rock are: the La Fosse Quay (635 metres) and the Ernest Renaud Quay (258 metres), re-faced between 1904 and 1912, and the Fernand Crouan Quay (300 metres) re-faced (for 284 metres) between 1924 and 1927.

More recently, in 1922, the West India Quay (556 metres), which likewise consisted of an old wall founded on a rubble base mound and protected by timber fendering, was re-faced and floored for a width of 9.8 metres. The Roche Maurice Quay (500 metres) includes a framed structure of similar type, but built where there was none formerly; it has, at the back, a vertical curtain wall for retaining the earth filling.

This type of structure has been generally abandoned in the construction of the later quays, but in the extension of the St. Louis Quay special difficulties arose which necessitated reversion to a type in which stays are employed to give the needed rigidity to a wall built on reinforced concrete columns embedded in the rock.

The new quays established along the Pirmil branch, under sanction of the decree of 7th July, 1913, are of a different type. They are, for a length of 469 metres, quays on arches bearing on caissons sunk to the rock, where the rock is at shallow depth. For a further length of 1,085 metres these quays have vertical piles driven to rock and supporting a

thick slab of armoured concrete, upon which is built a vertical wall anchored back to the solid fill. These quays have in turn been further improved upon, the thick slab being replaced by a lighter decking of reinforced concrete formed at a higher level and thus less subject to tidal wash during execution. The quays conforming to this type are the new Aiguillon Quay (390 metres) and the Gasworks Quay (60 metres).

Finally, there are three mooring berths at the oil wharves of St. Herblain, comprising 90-metre stagings and dolphins of reinforced concrete.

Excepting certain of the older quays, all these riverside works have a depth alongside of not less than 8 metres at lowest low water.

(b) BRANCHES OF THE LOIRE AND ERDRE THROUGH NANTES. The success of the improvements effected in the maritime Loire entailed of necessity an appreciable lowering of the low water level. It was reduced from $+2.80$ in 1880 to $+1.45$ in 1935. The stability of numerous structures founded on piles was endangered, and especially that of a certain number of bridges, several quays and some

buildings; two bridges indeed, one of which crossed a waterway since filled in, actually fell into the river.

The works carried out under the law of 1913 having given sufficient passageway for flood waters, by improvement of the two main branches of Pirmil and La Madeleine and notably by the construction of new bridges in place of old ones, it became possible to fill up the other two branches, which were of secondary importance and upon which were located most of the works threatened with collapse. This solution was adopted: in addition to the actual work of filling in the two branches, named after the Exchange and the Hospital, it involved the diversion of the Erdre through a tunnel under part of the city and the construction of a barrage with sluice gates at the new junction of the Erdre and the Loire.

(c) THE UNDERGROUND TUNNEL: The tunnel, which is 730 metres long, has several sections in succession which differ considerably from each other.

The normal profile, adopted for 550 metres, comprises:—

A semi-circular arch with a diameter of 10 metres, in mass concrete, 60 centimetres thick at crown and 1.37 metres at haunches.

An invert sunk in the rock, 8.4 metres deep and 10 metres wide.

Concrete revetments of the sides, of variable thickness, to resist sliding of the beds of rock inter-layered with beds of clay.

For 172 metres, the limited headroom available under ground level necessitated the adoption of a profile of reduced height, consisting of a pair of abutments 2.25 metres thick, of mass concrete, carried down to rock at the level of 0.50, spaced 8.5 metres apart in the clear and covered over with a ribbed roof of reinforced concrete.

(d) THE SLUICE BARRAGE: The barrage constructed in the St. Felix branch is provided with two sluices having lifting gates, $7\frac{1}{2}$ metres wide, upon a mass concrete foundation raft carried on piles and surrounded by a sheet-piling cut-off.

The lock for inland navigation has an effective length of 50 metres and a width of 7 metres. The concrete foundation raft and masonry side walls were built in the dry within a sheet-piled cofferdam. The lifting gates are balanced by counterweights and operated electrically.

The barrage enables the Erdre to be completely isolated from the Loire up to the level of $+10.00$ (above zero of charts) and the low lying quarters of the City to be protected against river floods.

Ports of the Lower Loire—continued

The total value of the works is 53,000,000 francs.

The filling in of the North branch, by creating wide open spaces in the heart of the City, has brought about a settlement of two particularly difficult problems:—

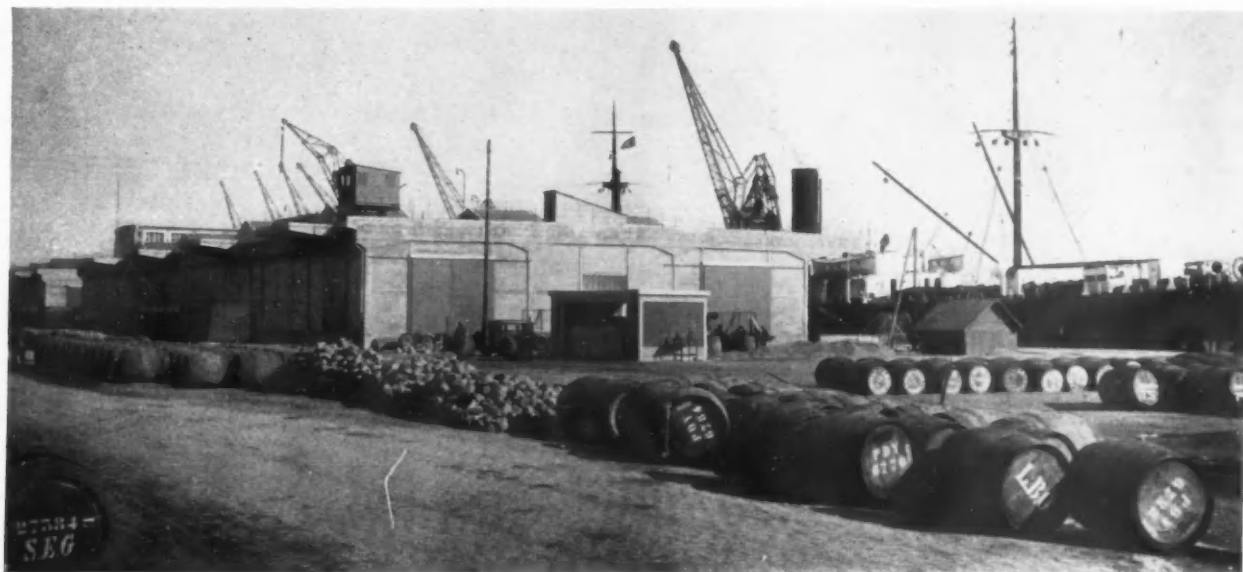
(1) The reconstruction under ground of the Nantes-Quimper Railway, which hitherto has traversed the built-up area on the level; along the course of the filled-up Hospital branch the line can be graded down to pass eventually in tunnel under the City.

(2) The layout of new central avenues, providing a happy solution to the problem of traffic circulation through the City.

the City, the Cormerais Quay; heavy bulk cargoes such as ore, phosphates and pyrites, are handled almost entirely at the Wilson Quay, and coal exclusively at the Wilson and Roche-Maurice Quays: the Ernest Renaud Quay gives preference to goods consigned to the warehouses of the Chamber of Commerce: Colonial produce is landed at the St. Louis and West India Quays.

The private quays are reserved for the traffic of the companies owning them, trading in coal, phosphates, pyrites, oil-seeds and petroleum products.

The quays of the river port on the Loire are used indifferently by all traffic, except for the Dumont d'Urville Quay, recently



A Shed of the Compagnie Generale Transatlantique, Wilson Quay, Port of Nantes.

IV—Equipment

The Port of Nantes.

(a) QUAYS AND EQUIPMENT.

(i) **Quays:** The public quays of the maritime port of Nantes have an aggregate length of 5,741 metres (5½ km., or 3½ miles) made up as follows:—

Position	Quay	Length Metres	Total Metres
Right Bank	La Fosse	635	1,880
	Ernest Renaud	378	
	Aiguillon	472	
	St. Louis	395	
Left Bank	André Rouys	300	1,152
	Fernand Crouan	296	
	West India	556	
Pirmil Branch	Wilson	—	1,554
Lower Loire	Cordon Bleu	175	1,155
	Roche Maurice	500	
	Gasworks	60	
	Emile Cormerais	420	
		Total	5,741

Beside the public quays named above, there are on the right bank of the Loire, between the St. Louis Quay and the Emile Cormerais Quay, numerous private jetties and wharves, on the frontage of waterside factories, having a total length of 1,040 metres.

Apart from the maritime port, the river port for inland navigation has 11,900 square metres of inclined landings:—

La Madeleine branch, 4,700; River Erdre, 7,200; making a total of 11,900 square metres.

In the maritime port, the regular steamship lines have each a berth specially reserved, as under, viz:—

Chargeurs Réunis and Société Navale de l'Ouest, St. Louis Quay; Compagnie Générale Transatlantique, Wilson Quay; Compagnie Nantaise de Navigation à Vapeur, Compagnie Hutchison and Compagnie Worms, La Fosse Quay; Messageries Maritimes, Ernest Renaud Quay.

Excepting these reserved berths, the public quays of the port are in theory for common user and the service of any kind of traffic without distinction. In practice, however, following the growth of trade, each of the quays has gradually become appropriated, more or less completely, for different classes of goods. Thus the petroleum traffic is handled at the quay furthest from

inaugurated, where are grouped the services of water transport between Nantes and the Loire basin: Saumur, Angers, Le Mans, Chateau-Gontier, Laval.

A special berth for handling inflammable and dangerous goods has been set apart at the upper end of Barbin Quay on the River Erdre.

The smaller ports of the lower Loire have the following accommodation:—

At Paimboeuf: A public quay, 185 metres long, and the jetty of the superphosphate works, 250 metres long and 70 metres out from the shore.

At Corges: A jetty and dolphin berths for oil tankers. The traffic is almost exclusively in petroleum products and "black" materials, tar and bitumen:—

(ii) **Equipment:** The machinery equipment for public use in the maritime port comprises:—

(a) Three Fixed Machines: derricks and sheer-legs; capacity 3½, 15 and 60 tons.

(b) Sixty Steam Cranes: 1½ to 5 tons.

(c) Fifty-seven Electric Portal Cranes: 1½ to 30 tons.

(d) Two Floating Cranes: 5 tons.

(e) Several special machines: four sack-fillers, with automatic weighing apparatus, and electric transporters from the Ernest Renaud Quays to warehouses.

All this public machinery equipment is exploited by the Nantes Chamber of Commerce, and in addition to it the equipment belonging to private waterside industrial establishments comprises 34 steam and electric cranes, ranging in capacity from 1 to 9 tons, 2 sheer-legs of 30 and 8½ tons, and a floating pontoon crane lifting 100 tons.

The Wilson Quay is appropriated to heavy bulk cargoes. The 6-ton electric cranes installed there attain rates of discharge of ore at 90 to 100 tons per hour, stacking at 100 tons per hour, and loading into ship at 250 tons per hour.

The distribution of machines and the rate of handling at this quay in 1935 were these:—

Cranes	H.P. on Quay	Tons handled per lineal metre per annum
2 Steam: 5 tons	104	432
6 Electric: 3 "		
2 " 5 "		
7 " 6 "		
2 " 12 "		

At Paimboeuf there are 6 electric cranes, ranging from 1½ to 6 tons: total 22½ tons.

Ports of the Lower Loire—continued

(iii) **Overhauling Facilities :** The public facilities for overhaul in the Port of Nantes are two in number: a floating dock and a slipway, whose leading dimensions are given hereunder:—

Floating Dock.

Length of pontoon, overall, 110 metres; lifting capacity 4,200 tons; longest vessel that can be docked, 120 metres; electric cranes (3-ton), 2; electric capstans, 4.

Slipway.

Length of cradles, 1 of 51.28 metres and 1 of 40.12 metres—total 91.40 metres; largest vessel that can be lifted—length 100 metres; weight 1,800 tons.

There is also a small private slipway at the Versailles Quay on the Erdre, 20 metres long and 3 metres wide, for the repair of barges.

(b) **SHEDS AND STORES—MARINE STATIONS:** There is only one railway station, on the Ernest-Renaud Quay, for the service of all the quays on the right bank: La Fosse, Ernest-Renaud, Aiguillon and St. Louis.



Ship discharging Coal with 6-ton Cranes, Port of St. Nazaire.

The rail traffic of the down-stream quays—Roche-Maurice and Cormerais—is handled in the Chantenay station; and that of the Quays André Rhuys, Fernand Crouan, West India and Wilson, on the sidings of the station at Nantes.

The marine station has an office for the Company's staff and sorting sidings about 700 metres long.

Public sheds have been erected on all quays excepting the Cordon Bleu, Fernand Crouan and André Rhuys, and these sheds provide a total covered area of 25,147 square metres.

The public warehouses and stores of the Chamber of Commerce cover an area of 44,099 square metres; while privately-owned stores add a further area of 16,950 square metres.

(c) **MEANS OF DESPATCH—RAILWAYS:** It has already been remarked that the filling up of superfluous branches of the Loire is enabling the Paris-Quimper railway to be carried underground in its passage through Nantes.

These works are to be accompanied by the complete re-modelling of the Nantes stations, the amalgamation of two passenger stations of the P. O. Company and the State Railway in a single station, also of their two goods stations in a single station, and the creation of a sorting yard for goods trains. This extensive works programme will set the centre of the city free from railway lines.

On the other hand, a project for the construction of a line from Nantes to Indret, along the left bank of the Loire, is shortly to be declared as of "public utility." This will provide means, not only for the service of the factory at Indret, but also for the industrial and maritime development of the whole of the left bank of the river between Nantes and Indret.

The filling up of the useless branches of the Loire and of the Erdre as far as Morand Bridge will also permit the creation of wide avenues of communication to link up the main roads which radiate from Nantes. These works, supplemented by the erection of a new line of bridges over the branches of the Loire, will enable Nantes to become a traffic centre for the whole region, whose development is at the present time very impressive.

(d) **SPECIAL SERVICES:** The pilotage of vessels between Nantes and the sea is carried out by pilots attached to the pilotage service having offices both at Nantes and at St. Nazaire.

There is no official towing service in the Port of Nantes. Towing of ships is undertaken by the "Bees" Company ("Les Abeilles"), whose headquarters are at Havre, and towing of barges by several privately-owned tugs.

On the Erdre, a tug subsidised by the State, tows barges that are not self-propelling. These dumb barges are gradually being replaced by motor barges.

The Port of St. Nazaire.

(a) **QUAYS AND EQUIPMENT:** The quays of the St. Nazaire Dock are for general cargo and carry no special handling machinery. Travelling cranes, of 3-ton capacity, run on the quayside tracks.

The Pèreire Quay is allotted to the ships of the Compagnie Générale Transatlantique, serving on the Colon and Mexico lines. It has a 5-ton electric crane for handling bunker coal.

The tidal stage in the Outer Basin serves for the landing of general cargo from small vessels engaged in the international coastwise trade and of timber from Scandinavia. It is provided with two 2-ton electric cranes.

The West Quay of the Penhoet Dock has a full equipment of machinery for handling coal, comprising 15 electric cranes, from 3 to 10 tons capacity. This quay receives the coal, which is the principal import at St. Nazaire, and exports scrap-iron arising from the vessels broken up in the shipyard. This scrap-iron is handled, according to its varying nature, either by electro-magnets or by grabs.

The quay at the North of the Penhoet Dock is appropriated to the Loire Shipbuilding Works ("Ateliers et Chantiers de la Loire") for the fitting-out, while afloat, of vessels under construction. This quay is equipped with lifting machinery as under:—

			Height metres	Radius metres	Capacity tons
1 Fixed Electric Crane	...	...	53	25 42 8	180 75 72
1 Travelling Electric Crane	...	...	32	12	6

Part of the East and South quays adjoining the entrance to the drydocks is likewise allocated to the Penhoet Yard as a fitting-out berth: a dredged bottom, as we have seen, is alongside the outer portion of these quays, giving a depth of 12 metres.

The equipment of these quays comprises the following machines:—

			Height metres	Radius metres	Capacity tons
1 Fixed Electric Titan	...	...	54	20 38	180 60
1 Travelling Electric Crane	...	...	33	12 22	5 24
1 " " " "	...	...	51	174 40	50 9

The South section of the West quays, called the "Prise d'Eau" Quay, is provided with three 3-ton electric portal cranes, which serve generally in the handling of iron for export and coal for import.

There are, in public or private ownership, several floating cranes and sheerlegs, ranging in capacity from 3 tons up to 100 tons. There are also electric capstans for the haulage of wagons, and weighing and bagging machines for grain.

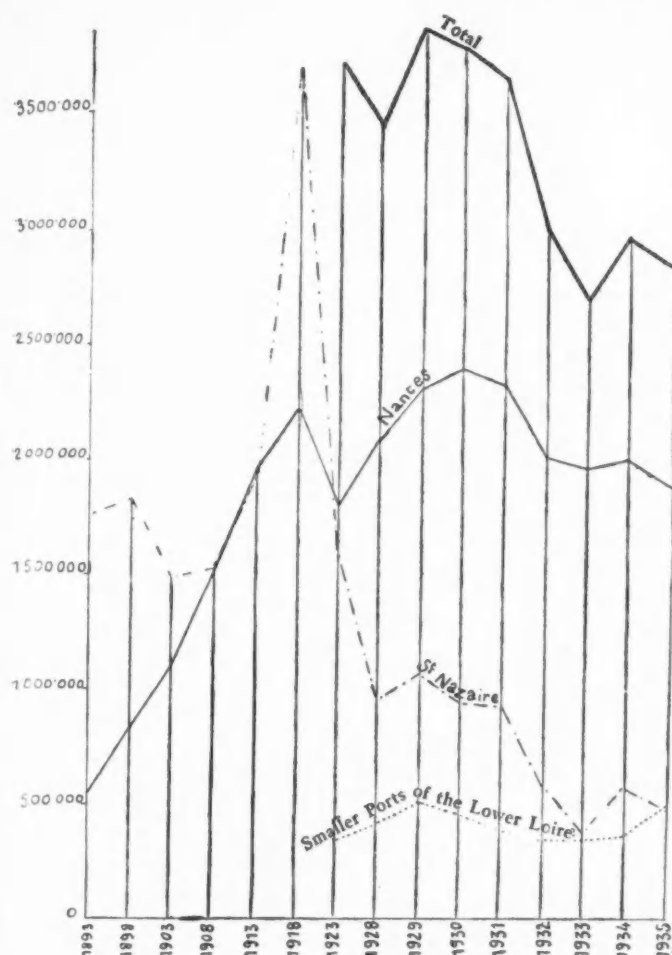
Finally, the public equipment of the port includes the dry docks already described under other heads.

(b) **SHEDS AND STORAGE GROUNDS:** The Chamber of Commerce owns stores and sheds covering an area of 15,000 square metres, and the Compagnie Générale Transatlantique owns others of equal area. The storage grounds appertaining to the port cover 100 hectares (about 250 acres) and two grids of storage sidings cover a further area of 67 hectares (150 acres).

(c) **MEANS OF DESPATCH—RAILWAYS:** All the quays in the port are served by railway sidings, the total length amounting to 40 kilometres of line for 4 kilometres of quayage. These tracks are connected with the State system (in direct communication with Châteaubriant, Segré, Le Mans and Paris), and the P.O. Midi Company's system (communicating with Nantes, Tours, Paris, Lyons and Geneva); while there is a large sorting station at Montoir-bourg, 6 kilometres from St. Nazaire.

Beside this way of despatch by rail there is another by inland navigation. Barges go up the Loire to Nantes, and from thence either continue up the river, which is navigable to Angers, or else take the canal from Nantes to Brest.

Ports of the Lower Loire—continued



Tonnage of Goods.

For the Smaller Ports there are no Statistics earlier than 1923.

Finally, there are important roads leading from St. Nazaire in the directions of Lorient, Rennes, Châteaubriant and Nantes, which give facilities for despatch by motor lorry.

(d) SPECIAL SERVICES: A private company undertakes the towage of ships in and out of the port and manœuvring them in the docks, and owns five tugs, one being of 1,000 h.p. Another company owns barges and lighters, which serve for discharging vessels while moored in the roads.

V—Traffic

The Port of St. Nazaire.

The principal channels of trade and commercial relations are those with:—

England, for coal and resin, as imports; foodstuffs, scrap-iron and pit-props, as exports; Spain, for iron ore, imported; Poland, for scrap-iron, exported; Sweden and Norway, for

soft-wood timber, imported; America, for tinned food, frozen meat, sugar, coffee, etc.; the ports of France, Algeria and Morocco, for miscellaneous merchandise, especially wines.

There are lines which regularly frequent the port. In the first place, St. Nazaire is the terminal port for the main service of the Compagnie Générale Transatlantique to Colon and Panama, calling at the West Indies and Venezuela, also to Mexico, calling at Santander, Corunna and Havana.

Other vessels frequenting St. Nazaire are those of the America-France line, those of the C.G.T. and the Messageries Maritimes trading to North Africa, and those of the Nantes Shipping Company engaged in trade along the French coast and to England.

On reference to a graph shewing the trade of the port in goods-tons inward and outward, it is surprising to notice the very rapid increase of traffic from the creation of the port up to the late War. At that time navigation up the Loire was very difficult and St. Nazaire took a large proportion of the traffic. The War naturally engendered a fictitious activity. Since 1926, traffic has declined, for diverse reasons.

Industrial and political movements affecting the coal trade and railway rates on the one hand, and on the other hand the electrification of part of the Orleans railway system, have lost to the port a large volume of traffic in coal; the diminished demand of the very important iron works at Trignac, near St. Nazaire, led to reduced importation of coal and ore. Lastly, the world crisis super-imposed its effect upon the local factors just recited.

The port is used by some trawling vessels; it is well situated in relation to fishing grounds, and it is reasonable to anticipate some development along that line.

St. Nazaire Shipbuilding Yard.

Shipbuilding has, in the port of St. Nazaire, made a remarkable advance. There is no doubt that St. Nazaire has in this respect the greatest capacity of any port in France. There are two leading establishments:—

The Penhoet Shipyard, founded in 1861 by the Compagnie Générale Transatlantique, occupies an area of 25 hectares (62 acres) and has 5 building berths, of which the largest was used for the construction of the "Normandie." 5,500 workmen are employed. Its fitting-out quay has two berths, one for a vessel about 150 metres in length and the other for one over 300 metres in length and having a draft of 11 metres. This Yard has built, in particular, the liners, "France," "Paris," "Ile de France" and "Normandie," as well as numerous vessels for the French Navy.

The Loire Shipyard has accommodation approaching the same capacity and about to be extended. It occupies in the port territory an area of 20 hectares (50 acres), has 6 launching berths, of which three are to be replaced by one which will enable vessels of more than 300 metres in length to be built without launching. Its fitting-out quay in the Penhoet dock is 230 metres long. This Yard employs 3,500 workmen and has built very many vessels, both for the Navy and for the merchant service. It has established an aircraft factory, 15,000 square metres in area, equipped on modern lines.

Alongside these two principal yards are others which specialise in ship-repairing. As the port is provided with four graving docks, whose tariff of charges is one of the most reasonable in France, a large number of vessels come here, every year, for overhaul.

IMPORTS

Class of Goods	1930				1931				1935			
	Nantes	Small Ports	St. Nazaire	Total	Nantes	Small Ports	St. Nazaire	Total	Nantes	Small Ports	St. Nazaire	Total
Coal ...	989,793	127,425	502,993	1,620,211	990,501	121,423	397,252	1,509,176	799,499	62,771	289,295	1,151,565
Resin ...	19,263	—	8,065	27,328	23,487	—	6,268	29,755	21,186	—	7,250	28,436
Ore ...	—	24,144	7,908	32,047	700	18,146	45,871	64,717	1,350	3,893	1,491	6,734
Metals and Machinery	29,777	10,009	14,813	54,629	22,564	15,782	14,460	52,806	18,358	17,104	4,412	39,874
Asphalt and Tar ...	21,915	—	250	22,165	10,064	12,936	7,142	30,142	16,411	12,430	—	28,841
Pyrites ...	84,535	33,809	—	118,344	57,563	17,317	—	74,910	40,054	10,975	—	51,029
Phosphate ...	208,553	73,491	1,705	283,749	157,457	36,085	—	193,542	100,806	24,446	1,836	127,088
Nitrate ...	32,646	—	1,026	33,672	39,818	—	—	39,818	2,350	880	—	3,180
Building Materials ...	29,659	360	13,187	43,156	30,741	—	19,982	50,723	39,338	1,610	26,957	67,905
Spirit ...	27,243	66,653	13,456	107,352	36,552	71,725	58,428	166,705	100,274	26,491	31,335	158,100
Kerosene ...	6,239	15,065	—	21,304	8,198	14,308	—	22,506	10,325	13,870	—	24,195
Fuel Oil ...	—	—	—	—	—	150	—	150	—	19,108	—	19,108
Crude Oil ...	—	—	—	—	—	—	—	—	—	184,798	—	184,798
Lubricating Oil ...	—	—	2,064	2,064	—	—	1,218	1,218	—	—	1,121	1,121
Timber ...	29,410	9,373	20,644	59,427	28,787	11,543	13,497	53,827	12,910	3,934	5,534	22,428
Wood Pulp & Paper	19,270	—	—	19,270	20,448	—	—	20,448	4,998	—	—	4,998
Oil Seed ...	15,111	—	4,110	19,221	17,716	—	2,940	20,656	—	—	—	—
Bananas ...	—	—	—	—	9,964	—	—	9,964	19,194	—	—	19,194
Grain and Flour ...	23,112	—	4,103	27,215	87,836	—	74,999	162,835	23,065	—	110	23,175
Rice ...	9,816	—	—	9,816	28,768	—	—	28,768	32,351	—	500	32,851
Sugar ...	50,194	—	620	50,814	45,974	—	267	46,241	54,052	—	—	54,052
Wines and Spirits	114,199	—	14,741	128,940	136,529	—	18,497	155,026	95,863	—	16,334	112,197
Sundry ...	102,623	222	17,297	120,142	94,843	370	41,862	137,075	84,934	3,678	14,733	103,345
Totals ...	1,818,558	360,551	626,957	2,806,066	1,848,510	319,815	702,683	2,871,008	1,477,318	385,968	400,908	2,264,214

Ports of the Lower Loire—continued

EXPORTS

Class of Goods	1930				1931				1935			
	Nantes	Small Ports	St. Nazaire	Total	Nantes	Small Ports	St. Nazaire	Total	Nantes	Small Ports	St. Nazaire	Total
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Coal	29,574	—	49,786	79,360	51,773	—	44,402	96,175	29,367	—	4,907	34,274
Ore	232,655	1,850	107,785	342,290	140,865	—	77,630	218,495	156,655	—	—	156,655
Metals and Machinery	6,472	7,487	21,973	35,932	5,956	13,318	14,139	33,413	5,774	16,074	10,117	31,965
Pyrites	39,447	29,122	—	68,569	31,800	13,410	—	45,210	27,768	15,240	—	43,008
Superphosphate ...	5,958	15,834	—	21,792	440	3,531	—	3,971	2,013	—	—	2,013
Building Materials ...	56,530	—	—	56,530	109,989	36	89	110,114	43,124	—	124	43,248
Spirit	—	28,278	1,445	29,723	175	32,072	17,504	49,751	3,992	23,196	872	28,060
Kerosene	—	5,211	—	5,211	—	2,251	—	2,251	—	3,290	—	3,290
Fuel Oil	—	2,253	7,498	9,751	—	150	6,461	6,614	—	21,311	15,933	37,244
Lubricating Oil ...	—	—	—	—	—	—	—	—	—	5,824	217	6,041
Heavy Oil	—	—	—	—	—	—	—	—	—	12,404	—	12,404
Timber	2,335	—	33	2,418	1,568	—	16	1,584	649	139	—	788
Pit Props	3,914	—	—	3,914	—	—	—	—	—	—	—	—
Grain and Flour ...	57,387	—	1,455	58,842	3,598	—	2,664	6,262	48,525	—	—	48,525
Sugar	4,786	—	—	4,786	5,919	—	—	5,919	4,560	—	—	4,560
Wines and Spirits ...	14,510	—	823	15,363	17,201	—	526	17,727	6,562	—	2,093	8,655
Sundry	125,146	60	21,138	146,344	111,786	61	17,828	129,675	71,105	505	11,244	82,854
Totals	578,794	90,035	211,936	880,825	481,070	64,829	181,262	727,161	400,089	97,973	45,507	543,569

The Port of Nantes.

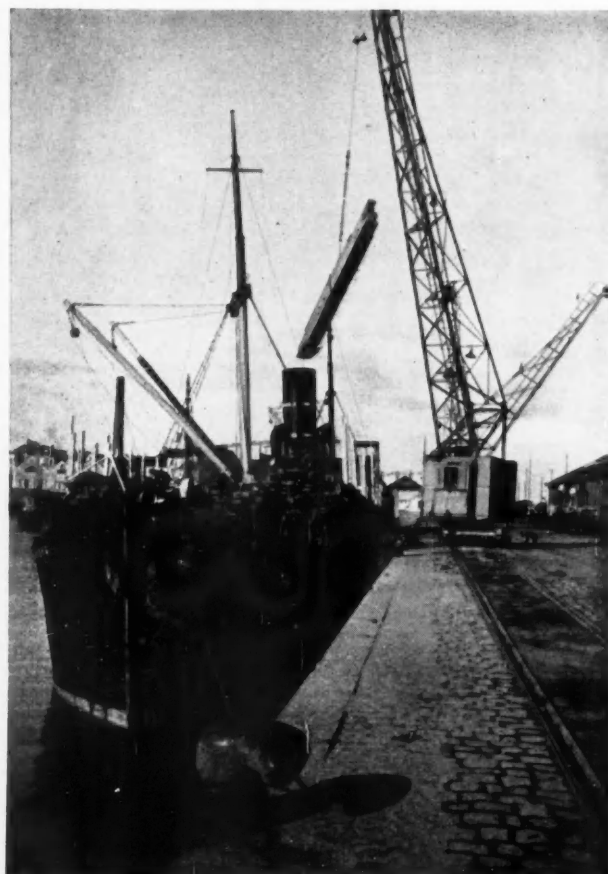
As indicated in the first section of this article, the trade of Nantes, which had fallen to 503,436 tons in 1886, had risen again to 998,798 tons in 1900. Since then it continually increased and in 1913 reached the figure, for Nantes alone, of 1,963,715 tons, and for Nantes and the smaller ports of the Lower Loire taken together, the total of 2,150,259 tons.

During the War, this traffic, after declining in 1914, increased considerably in the following years, in consequence of the important part played by Nantes in the revictualling of the nation, and attained in 1916 the maximum figure of 3,068,567 tons of goods imported.

After a decline in 1917, due to blockade and submarine war, and a recovery in 1919, due to the creation of an American base at Nantes, it declined again considerably after the cessation of hostilities and amounted only to 1,365,612 tons in 1921 during the post-war crisis.

But since that time, the port of Nantes has gone ahead regularly, from year to year, and its trade, except for a slight set-back in 1926 during the English coal strike, made constant increase until in 1930 it reached 2,842,798 tons for the grouped ports of Nantes and the Lower Loire, made up of 2,173,909 tons imported and 668,889 tons exported.

But, from 1931, the economic crisis has made its effect felt and the traffic declined first to 2,714,224 tons in 1931, and then down to 2,361,368 tons in 1935.



Ship discharging Timber at the Tidal Quay, Port of St. Nazaire.

The coastal services of the Compagnie Nantaise, the Compagnie Worms and the Messageries Maritimes, maintain direct communication with the principal French ports: Brest, Caen, Rouen, Havre, Boulogne, Dunkirk, Bordeaux, Marseilles, as well as with the smaller ports on the coast: Belle-Ile, Lorient, Ile d'Yeu and Ile de Ré.

The Compagnie Nantaise also runs regular services to London, Morocco and Portugal. The Hutchison Company provides a regular service between Nantes and English ports.

The Compagnie Worms puts Nantes in communication with the Belgian and Dutch ports of Antwerp, Rotterdam, Amsterdam; with the German ports of Hamburg and Bremen, and with the Polish and Silesian ports of Danzig, Königsberg and Revel.

The Algiers and Tunis line of the C.G.T. calls regularly at Nantes, as also does its line to Guiana and the West Indies.

Lastly, the "Chargeurs Réunis" link Nantes with the French colonies of Indo-China and West Africa.

River traffic, both on the Erdre and on the Loire, has considerably increased since 1925, but the present crisis has retarded the improvement. This traffic through the river port, which had increased from 146,838 tons in 1926 to 259,425 tons in 1931, has since, owing to the crisis, suffered diminution as indicated below: in 1932—229,777 tons; in 1933—217,213 tons; in 1934—208,167 tons.

On the Loire, the traffic is still restricted and much below the possibilities of expansion, by reason of the lack of the special craft which might give it an impetus. The goods carried are principally the following:—Building materials: lime, slates; Raw materials for the metal trade; Foodstuffs: flour, wheat, wine.

This traffic on the Loire has continued to progress, despite the crisis, since from 14,400 tons in 1924 and 33,216 tons in 1931, it has since attained the tonnage indicated in the table below:—

	1932	1933	1934	1935
Downstream ...	13,293	14,996	14,634	14,544
Upstream ...	40,912	44,333	33,881	41,541
Total ...	54,205	59,329	48,515	56,085

VI—Future Prospects

The economic crisis is adversely affecting the Port of Nantes and still more the Port of St. Nazaire, as it is affecting most other sea ports; although the Port of Donges, on the contrary, is experiencing a steady increase of traffic, owing to the recent installation there of a petroleum refinery.

At the same time, St. Nazaire remains the terminal port of the lines to Colon, the West Indies and Mexico, and its possibilities as a coal port are considerable.

Nantes likewise profits by a geographical situation which is very favourable for communication with Southern seas.

The oil installations at Donges, moreover, are in process of expansion.

The approaches to the Port of St. Nazaire have been improved, and the maritime Loire, whose restricted depth was an obstacle to development of the Port of Nantes, will soon be fully rectified; the new channel in process of formation between Paimboeuf and St. Nazaire will enable the largest tankers to get up to Donges.

Furthermore the construction of a railway along the left bank of the Loire, between Nantes and Indret, will make provision—for decades to come—for all extensions that may be needed by the public port and by industry.

Ports of the Lower Loire—continued

The modernisation of the public machinery equipment is methodically progressing.

Finally, from the point of view of communication with the interior, considerable improvements are either in course of execution or about to be undertaken in Nantes. Large open spaces are set free in the central part of the city which will allow motor traffic plenty of scope for rapid development without hindrance.

The railway stations at Nantes are to be completely remodelled and provided with the improvements necessary for the rational service of intensified traffic.

On the inland navigations, the replacement of dumb barges by motor barges is making remarkable progress.

Lastly, the port of St. Nazaire is witnessing the extension of its facilities for naval construction.

Thus the Ports of the Lower Loire, although their development has been retarded by the general crisis, will be ready in the near future to cope with increased traffic and to attain to a position commensurate with their situation and with the efforts that have been made.

Notes on Recent Legal Decisions

BY-LAW 19 of the Port of London Dock provides that no person shall work or cause to be worked the propelling engines of any ship in dock for any purpose except with the previous consent of the dockmaster and in such time and place and in such manner as he shall approve. Such consent is only given (if at all) on the terms that the person on whose behalf the application for the same is made will be responsible for all damage caused by working such engines and will indemnify and save harmless the Authority and its officers against all claims in respect of such damage. In the case of the *Clan Colquhoun* (1936) T.L.R. 349, the defendants' steamer was bound for the Tilbury main Dock through the New Lock entrance and two tugs belonging to the plaintiffs, the Port of London Authority, had been engaged to assist her into her berth. On each side of her poop rails the following notice was exhibited—"Twin screws: keep clear of the blades." When the dockmaster sounded the recognized signal for her to go ahead on her main engines, which was done, she steamed slowly out of the lock with one of the plaintiffs' tugs made fast ahead. When the steamship was clear of the lock the second tug was manoeuvred alongside on her starboard side, but before the tow rope could be passed and made fast, the tug was permitted to drop astern and so came into collision with the blades of the moving starboard propeller of the steamship and thereby sustained serious damage. It was held (Bucknill J.) that By-law 19 did not apply to the defendant vessel at a time when she was being navigated through the dock from the Lock entrance, and that even if the By-law did apply there was no breach of it by the defendants' vessel, because the previous consent of the dockmaster to use her engines had in effect been given.

The plaintiffs' claim against the defendants in the same case was laid on this other ground: The tugs had been engaged to tow on the terms and conditions of the Port of London Towage Order, which *inter alia* declares—"(1) For the purpose of these terms and conditions, the towage or transport shall be deemed to have commenced when the tow rope has been passed to or by the tug and to have ended when the tow rope has been finally slipped; (4) the owner or owners of and/or person or persons interested in the ship, vessel or craft so being towed or transported hereby agree and undertake to bear and pay for any loss of or damage to any of the Port Authority's property (including the tug or tugs engaged in such towage or transport) occurring in the course of or in connection with the towage or transport which may arise from or be occasioned by the following causes, perils or other things, namely collisions or anything done in contemplation or furtherance thereof and whether caused or contributed to by the negligence, default or error of judgment of any officers or servants of the Authority, provided always that the said causes, perils or other things have not resulted from any failure of the Port Authority or its servants or agents to exercise due diligence to make the tug seaworthy." In construction of these provisions, the same judge held that the towage would begin when the tow ropes were passed to "each of the tugs" and not "either of the tugs" and that as the tow rope for the second tug (which alone was in fault for the collision) had not been passed at the time of the collision, the towage must be deemed not to have been begun, and that therefore the ordinary provisions of the common law applied, and the plaintiff authority was not entitled to be indemnified for the damage they had suffered.

Article 8 of the Harwich Harbour Conservancy Board (1929) By-laws provides—"A steam vessel navigating against the tide shall on approaching points or sharp bends in the fairway ease her speed and if necessary stop and wait before rounding, so as to allow any vessel navigating with the tide to round and pass clear of her. In the case of *The Juliana* (1933) T.L.R. 269, it was held that the above article applied to the channel round Beach End Buoy at the entrance to Harwich Harbour, and that although the preponderance of blame for a collision which had occurred rested on the defendant vessel, the plaintiff vessel must also be held to be in fault

for failing to ease her speed when approaching the buoy against the tide.

A point of procedure in the last-mentioned case may be of interest. The pilot of the defendants' ship was not called as a witness by either side, but he had been subpoenaed to attend by the plaintiffs, who wished to put in as evidence against the defendants a report which the pilot had made to Trinity House in compliance with the Rules and By-laws made by them under the Pilotage Act. It was decided that the report having been made by the pilot at a time when his employment by the defendants had ceased and he had reverted to his position as independent pilot was not admissible as evidence against the defendants.

In the case of *The Uranienborg* (1936) T.L.R. 114, a tug was under contract to assist a steamship from a wharf to a place further down the river. By the terms of The United Kingdom Standard Towage Conditions which were incorporated in the contract the tug owners were to be generally speaking exempt from liability for damage occasioned to the steamship "whilst towing." Clause 1 of the conditions provided—"For the purpose of these conditions the phrase 'whilst towing' shall be deemed to cover the period commencing when the tug is in a position to receive orders direct from the hirers' vessel to pick up ropes or lines, or when the tow rope has been passed to her by the tug, whichever is the sooner, and ending when the final orders from the hirers' vessel to cast off ropes or lines have been carried out, or the tow rope has been finally slipped and the tug is safely clear of the vessel, whichever is the later.

No time had been fixed for the beginning of the towage, but over the telephone the tug owners had ascertained from the ship's agents that the ship was expected to finish discharging in time to move on the afternoon tide and that the tug should be in attendance about 11 a.m. Shortly before that hour on the day in question, the tug, having come up river, turned in at a speed which the court held to be excessive, through the barge tier which was off the wharf, and while approaching the steamship was so navigated as to come into collision with and seriously damage her. The tug owners contended that the collision occurred while the tug was towing within the meaning of the towage conditions and that therefore they were exempt from liability for the damage. It was held that Clause 1 of the Conditions must be read as if there were two parties concerned in the matter, that the phrase "in a position to receive orders" did not mean merely local situation, but had reference to the intentions of those on board the ship to give orders to pick up ropes or lines and involved also the tug being herself in readiness to receive and act on such orders; that at the material time the ship was without either pilot or boatmen, and there was no one on board her who was thinking of giving or preparing to give orders for the passing of ropes or lines, and on the other hand, the master of the tug was only concerned with correcting his own errors of navigation and trying to avoid a collision; that even from the point of view of the tug alone, the moment had not arrived when she was in a position to receive orders within the meaning of the conditions; and that the action therefore failed.

Quick Work with the "Queen Mary."

The ability of the Port of Southampton in dealing with the world's largest liners has been amply demonstrated by the ease with which the new Cunard White Star liner "Queen Mary" has been manoeuvred to and from her berth at the Ocean Dock. No less successful have been the traffic arrangements made for dealing with the exceptionally large number of passengers landing from the immense vessel. Within 3½ hours of the ship's arrival from New York on June 10th, Customs examination and other disembarkation formalities were completed, and approximately 1,200 passengers were despatched direct from the quayside shed in the Southern Railway's special ocean liner expresses.

Port of Southampton Topics

Docks Statistics for June.

SOUTHAMPTON DOCK statistics for June give indication of the continued growth of the number of ships using the port.

During June, 72½ vessels were dealt with, against 650 in June of 1935. The number of arrivals showed an advance of 44—from 323 to 367, and the departures were 362, being an advance of 35 on June of last year.

Net tonnage showed an increase in the inward total which was 911,439 tons, compared with 900,454 tons in the corresponding month a year ago. Outward the total was 883,155 tons compared with 1,003,814 tons, a drop of 120,659 tons.

Cargo, both inward and outward, recorded increases. The amount landed last month was 62,047 tons, against 60,898 tons for June of last year, and the outward loadings came to 28,120 tons, against 27,808 tons, the aggregate handled being 90,167 tons, against 88,706 a year ago.

There was a jump of nearly 5,000 in the number of passengers who passed through the port, although there were less embarkations than a year ago.

The arrivals numbered 35,147, against 28,550, but the departures dropped from 28,567 to 26,841. This is a surprising reduction, but the advance in the number of landings is very gratifying, and leaves the figures substantially better on the balance.

Maiden Voyage of Union Castle Liner.

The third of the four new Union Castle vessels to be placed in service this year, the "Dunottar Castle," has made her maiden voyage this month. The occasion is of considerable interest to Southampton, for she will be a regular visitor to the port. She will figure in the Company's service between the United Kingdom and South and East Africa, which means that she will utilise Southampton as a port of passenger disembarkation on her homeward voyages.

She will be followed shortly by a sister vessel, the "Dunvegan Castle."

Both the "Stirling Castle" and the "Athlone Castle" left Southampton on their maiden voyages in the Cape service this year, so that 1936 will see four new vessels, with a total tonnage of over 81,000 tons, put into commission for the Union Castle Company.

The new sailing schedule of the Union Castle Company indicates the changes that have been necessary in order to speed up the service under the terms of the new contract with the South African Government. An interesting feature in the list of sailings is that the "Dunottar Castle" and the "Dunvegan Castle" will be brought into the mail and passenger service from Southampton to fill gaps caused when some of the mail ships are taken off the run for overhaul and engine alterations.

The "Dunottar Castle" will, from December 11, make several voyages between Southampton and the Cape, instead of calling at Southampton only on homeward voyages. The "Dunvegan Castle" comes into the mail sailings from Southampton in February next year.

The speeding up of the service, cutting three days out of the normal passage, will begin with the August sailing of the "Stirling Castle."

Heavy Fruit Shipments.

Heavy shipments of South African citrus fruits are now being received at the Docks, and within a recent period of seven days, four vessels arrived here with large supplies of oranges, grapefruit, etc., for discharge. The Union-Castle Mail Steamship Company, whose vessels convey the bulk of the produce from South Africa to Southampton, have chartered five additional refrigerated cargo ships to assist in the carriage of the fruit during the height of the present season. The first of these, the "Nogoya," arrived on June 25th and landed at the new Docks Extension quays a consignment of 53,500 boxes for distribution to all parts of the country. Southampton's predominance in the South African citrus fruit trade is illustrated by the fact that during the 1935 season, approximately 80 per cent. of the total traffic shipped from the Union to Great Britain was dealt with at these Docks.

Australian and New Zealand fruit growers and shippers are giving increasing recognition to Southampton's unrivalled facilities for the rapid discharge and despatch of perishable produce, and already this season, considerable supplies of apples and pears from the two Colonies have been landed here. A recent consignment of New Zealand apples ex the Shaw, Savill and Albion Company's "Tamaroa," for discharge at this port, totalled 20,500 boxes.

Tenders Invited

Motor Launch for South Africa.

H.M. Trade Commissioner at Johannesburg reports that the South African Railways and Harbours Administration is calling for tenders, to be presented in Johannesburg by the 14th September, 1936, for the supply of a motor launch for harbour and sea cruising work.

Firms desirous of offering a launch of United Kingdom manufacture can obtain the further details of this call for tenders, upon application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1. Reference number T. Y. 30,553 should be quoted.

Passenger and Towing Motor Launch for South Africa.

H.M. Trade Commissioner at Johannesburg reports that the South African Railways and Harbours Administration is calling for tenders, to be presented in Johannesburg by the 14th September, 1936, for the supply of a motor launch for passenger and towing work.

Firms desirous of offering a launch of United Kingdom manufacture can obtain the further details of this call for tenders, upon application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1. Reference number T.Y. 30,555 should be quoted.

Sea-going Tug for Lourenco Marques.

H.M. Consul General at Lourenco Marques reports that Maritime Department, Lourenco Marques is calling for tenders to be presented at that Department by the 24th December, for the supply of a 450/500 ton sea-going tug.

Firms desirous of offering a tug of United Kingdom manufacture can obtain the further details of this call for tenders, upon application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1. Reference number T.Y. 30,577 should be quoted.

Hopper Barges for Argentina.

The Commercial Counsellor to H.M. Embassy at Buenos Aires reports that the Argentine Department of Navigation and Ports is calling for tenders, to be presented in Buenos

Aires by the 28th August, 1936, for the supply of four steel hopper barges (marine type).

Firms desirous of offering barges of United Kingdom manufacture can obtain the further details of this call for tenders, upon application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1. Reference number T.Y. 30,568 should be quoted.

The Port of Karachi.

In the month of March, 1936, 78 vessels with a net registered tonnage of 211,637 entered the Port of Karachi, and 82 vessels cleared of 227,158 n.r.t. The number of vessels which entered and cleared during March, 1935, were:—Entered 79 vessels of 208,559 n.r.t., and cleared 80 vessels of 207,967 n.r.t.

For the twelve months ending March, 1936, the number of vessels entering the Port of Karachi amounted to 905 of 2,403,093 n.r.t., and clearances amounted to 904 vessels of 2,408,046 n.r.t. During the twelve months ending March, 1935, 900 vessels entered of 2,347,777 n.r.t. and 904 vessels cleared of 2,356,350 n.r.t. The above figures do not include country craft.

The amount of cargo handled in March, 1936, was:—Imports 70,805 tons and exports 87,084 tons, a total of 157,889 tons of cargo. In the month of March, 1935, 84,069 tons of imports and 82,660 tons of exports were handled, a total of 166,729 tons. For the twelve months ending March, 1936, imports amounted to 839,485 tons and exports 1,015,446 tons, a total of 1,854,931 tons. During the twelve months ending March, 1935, imports were 780,854 tons and exports 1,175,285 tons, a total of 1,956,139 tons.

During the month of April, 1936, 82 vessels of 213,172 n.r.t. entered the port, and 81 vessels of 208,250 n.r.t. cleared, as compared with 81 vessels entered of 207,169 n.r.t. and 80 vessels cleared of 213,521 n.r.t. in the corresponding month of 1935. These figures do not include country craft.

The total quantity of cargo handled in April, 1936, was 161,256 tons, made up by imports, 64,636 tons and exports, 96,620 tons. During April, 1935, 149,544 tons of cargo were handled, of which imports accounted for 69,318 tons and exports 80,226 tons.

News from all Quarters

Australia

THE decision to exploit the large iron-ore deposits on Koolan Island in the Vampi Sound has necessitated the working out of plans for an effective harbour. It is stated that the Vampi Sound is one of the best natural harbours in the world, and will make an ideal base for a fleet. The importance of such qualities, moreover, is corroborated by the news that Sydney Harbour is to be altered into a naval base, on similar lines to that at Capetown.

In the first ten months of the fiscal year ending June 30th, 1936, Sydney was visited by 1,227 ships totalling 9.43 million B.R.T.—an all-round increase on the previous year. In May, 602 ships entered the harbour, of 1.52 million B.R.T. Brisbane in the same month received 130 ships, whilst the April figure for Adelaide was 92, and that for Fremantle 51 ships.

India

The harbour traffic of Bombay is on the increase again. In the first quarter of 1936, imports came to 849,000 tons, and exports to 663,000, making a total of 1.51 millions. The corresponding figures for 1935 were 845,000 and 562,000, making 1.41 million tons in all. Expressed in ships, 996 vessels of 1.70 million register tons entered Bombay in the first quarter of this year, as against 924 of 1.66 million r.t. in that of last year. Throughout 1935, however, the traffic comprised 3,154 ships of 6.19 million r.t., a rise from 3,077 ships of 6.04 millions in 1934.

South Africa

In the *Dock and Harbour Authority* for June, 1936, we reported that no new dredger would be tendered for by the Durban authorities. But it is now announced that the Union Government has bought the one now on the stocks in the yard of Messrs. Lobnitz and Company, of Renfrew. This will be one of the largest in the world, and will pump the sand dredged from the Durban sand-bar up on to the beach. When it arrives in Durban a dredger from that port will be sent to East London.

Further to the report of the replacement of the old floating dock at Capetown, it is now rumoured that Mr. Pirow, when in England, negotiated with the Government the purchase of the huge floating dock at Southampton for this purpose. Eventually a big graving dock will be built near the Woodstock foreshore, but as this will take some years, a floating dock is required in the interval.

U.S.A.

A newly extended harbour was recently opened at Brownsville, Texas. A twenty-mile canal connects the actual turning basin with the Gulf of Mexico. This harbour is designed not only as a base for loading agricultural produce from the valley of the Rio Grande, but to attract to itself the entire import and export trade of Northern Mexico.

In Mexico itself, work will start before the end of this year upon the construction of new quays to the harbour of Acapulco, on the West coast.

Argentina

A new dock is to be built at the naval base of Rio Santiago, for building larger ships than was possible hitherto. Five million pesos will be spent on this work. It will be so planned that three ships of different sizes can be laid down simultaneously. The maximum tonnage of ships built will be 8,000 for cruisers and 15,000 for steamers, but allowance is made for additional lay-outs which would take ships up to 30,000 tons. The yard will be able to employ 2,000 workers. Meanwhile, the present floating docks of 1,800 and 2,000 tons will be replaced by two of 8,000 and 10,000 tons.

China

The ocean-going traffic to reach Shanghai in the first quarter of 1936 amounted to 444 ships, or 2.07 million register tons. Britain led with 186 ships, followed by Japan with 146, the U.S.A. with 60, Germany with 26 and France with 19. Coastal shipping in all the Chinese ports totalled 1,484 ships in the same period, of 1.86 million r.t. China herself provided 672 of these, Britain 537, Japan 144 and Norway 43. The aggregate value of the cargoes received was 125 million Chinese dollars, against 150 millions in the first quarter of 1935 and 177 millions in that of 1934.

Belgium

In each of the last two issues of the *Dock and Harbour Authority*, favourable reports were given from Antwerp of the volume of traffic using that port. The sudden and striking reverse resulting from the three weeks' strike is apparent from a comparison of the figures for June of this year and of last:—

Flag	SHIPS ENTERING		SHIPS LEAVING			
	1936	1935	Loaded	In Ballast	1936	1935
Britain	...	142	250	114	221	29
Germany	...	73	198	58	162	13
France	...	33	61	23	54	8
Holland	...	57	131	49	91	3
Norway	...	43	59	27	50	11
Sweden	...	44	63	17	39	8
Belgium	...	38	46	18	39	2

The number of ships dropped from 1635 in June, 1935, to 519 in June, 1936, and their aggregate displacement from 1.79 million to below one million tons Moorsam (Belgian measure).

Greece

The total weight of goods dealt with in Piraeus Harbour during 1935 was 3.17 million tons. This comprised imports of 2.3 millions, exports of 377,000, and transit carriage, re-loading, etc., of 491,500 tons.

In Patras Harbour during June, 1936, 31 ships arrived, and the same number departed. The tonnage was about 65,500 in each case. The cargoes unloaded weighed 7,438 tons, but those loaded weighed only 1,552 tons.

Poland

The figures of traffic using the port of Gdynia for the first half of 1936 are as follows:—

	Jan.	Feb.	March	April	May	June
Number of Ships	446	327	373	387	398	398
Thousands of registered tons	436.3	343.2	298.2	360.3	384.8	382.0

Sweden, Poland, Britain and Denmark were the most frequent flags. In terms of cargoes the overseas traffic was 3.4 per cent. higher than in the same period of last year, the figures being 3.61 and 3.35 million tons respectively.

It is stated that the Danzig Dockyard Company has offered the town of Gdynia its shareholding interest in the Gdynia dock. The offer is at present under consideration.

Turkey

The Law dealing with the harbour administrations of Istanbul and Izmir, which ports, being a private French concession, were under the control of the Ministry of Finance, now hands them over to the Ministry of Commerce. The new authorities have extremely wide powers, including a monopoly upon all discharging and loading operations, inclusive of coal. On the business side they take the form of a private company, issuing yearly balance sheets. The amalgamation of the two harbours is anticipated in the Act, which also empowers the Ministry to put the funds of the one at the disposal of the other.

The extent of the duties of the Istanbul authorities may be judged from a glance at the volume of traffic passing through that port in the first quarter of this year. In all, 1,108 ships entered the harbour, totalling 2.26 million tons. 928 ships, of 1.74 million tons, were loaded and unloaded, the remaining 180 comprising through traffic. By nationalities, Turkey herself heads the list with 507 ships, of 733,000 tons; Britain follows with 110, of 293,000 tons, succeeded in order of tonnage by Italy, Rumania, Germany, Poland, the U.S.S.R. and France. It should also be noted that by the use of motor sailing boats, Greece has raised the volume of her shipping to Istanbul to five times its value in the last quarter of 1935.

Portable Conveyors.

A four-page illustrated leaflet describing Portable Conveyors has just been issued by Messrs. Spencer (Melksham) Ltd., Melksham, Wilts. This leaflet shows the many uses to which Portable Conveyors can be adapted, and copies of the leaflet can be obtained by any of our readers who are interested by sending their business address to Messrs. Spencer (Melksham) Ltd.

The Port of Colombo

Liquid Fuel Imports.

The quantity of liquid fuel imported at Colombo during May, 1936, amounted to 31,170 tons, as compared with 31,525 tons in May, 1935. For the first five months of 1936, 139,281 tons of liquid fuel were imported, as compared with 139,651 tons in the corresponding period of 1935.

Liquid Fuel Bunkers supplied to Steamers.

Liquid fuel bunkers supplied to steamers in May, 1936, was 46 ships bunkered with 22,956 tons of liquid fuel, as compared with 42 ships with 22,880 tons in May, 1935. For the first five months of 1936, the total number of ships bunkered was 224 with 107,704 tons of liquid fuel, as compared with 215 ships with 114,643 tons for the corresponding period of 1935.

Coal Imports.

The quantity of coal imported during the month of May, 1936, was 35,185 tons, as compared with 62,284 tons in May, 1935. Altogether 202,378 tons of coal were imported during the first five months of 1936, as compared with 192,418 tons in the corresponding period of 1935.

Coal Bunkers supplied to Steamers.

The number of steamers bunkered during May, 1936, was 68 with a total of 21,812 tons of coal, as compared with 79 steamers with 27,096 tons in May, 1935. During the first five months of 1936, 342 steamers were bunkered with 103,272 tons of coal, as compared with 378 steamers with 111,564 tons in the corresponding period of 1935.

Number and Tonnage of Vessels Entered and Cleared.

The number and tonnage of vessels other than country craft engaged in trade, which entered and cleared at the Port of Colombo during May, 1936, and the first five months of this year, with comparisons for 1935 and 1934 is as follows:—

		Vessels engaged in Foreign Trade		Vessels engaged in Coasting Trade	
		No.	Tons	No.	Tons
(a) Entered during May, 1936	...	221	1,028,132	5	8,169
" " " 1935	...	228	1,065,867	6	18,148
" " " 1934	...	219	1,022,315	2	6,347
During the five months ended May, 1936	...	1,111	5,180,038	26	64,147
During the five months ended May, 1935	...	1,139	5,282,485	19	52,997
During the five months ended May, 1934	...	1,101	5,089,723	18	53,806
(b) Cleared during May, 1936	...	227	1,037,288	4	7,582
" " " 1935	...	240	1,104,074	4	13,997
" " " 1934	...	225	1,031,989	2	7,710
During the five months ended May, 1936	...	1,126	5,320,798	16	51,938
During the five months ended May, 1935	...	1,158	5,282,525	10	36,223
During the five months ended May, 1934	...	1,116	5,118,517	14	50,728

Tonnage of Imports and Exports.

The tonnage of imports and exports at the Port of Colombo during May, 1936, and the first five months of this year, together with comparisons for 1935 and 1934 is as follows:—

		1934	During May 1935	1936
		Tons	Tons	Tons
Imports (excluding Coal and Oil)	...	90,569	97,438	79,072
Exports (" ")	...	67,686	53,202	46,609
Total	...	158,255	150,640	125,681
During the five months ended May				
		1934	1935	1936
		Tons	Tons	Tons
Imports (excluding Coal and Oil)	...	429,044	436,541	454,178
Exports (" ")	...	299,241	227,388	212,693
Total	...	728,285	663,929	666,871

Oil Facilities Receipts.

The oil facilities receipts for May, 1936, were Rs.105,782, as compared with Rs.65,000 during May, 1935. The total receipts for the first five months of 1936 were Rs.441,243, as compared with Rs.459,481 for the corresponding period of 1935.

The Port of Amsterdam

The position of the Port of Amsterdam in regard to number of vessels and tonnage and to goods traffic arrived and sailed, as compared with the corresponding figures of last year, is as follows:—

SEAGOING VESSELS AND TONNAGE.

		ARRIVALS			SAILINGS		
		No.	Per Cent.	N.R.T.	No.	Per Cent.	N.R.T.
June 1935	...	227		321,272	231		327,158
" 1936	...	254		367,062	246		330,494
		+27	+11.9	+45,790	+15	+6.5	+3,336
May 1936	...	254		351,879	251		367,739
June 1936	...	254		367,062	246		330,494
		—	—	+15,183	+1.3	—5	—2.0
Jan.-June 1935	...	1,425		2,139,884	1,429		2,151,525
" 1936	...	1,466		2,108,480	1,456		2,067,055
		+41	+2.9	—31,404	—1.5	+27	+1.9
							—84,470
							—3.9

SEAGOING GOODS TRAFFIC. (In Tons of 1000 Kilos*).

		1 Import	2 Transit incl. in col. 1	3 Export	4 Transit incl. in col. 3	5 Total col. 1 & 3
May 1935	...	235,726	54,869	133,506	63,473	369,232
" 1936	...	228,079	75,109	121,902	62,294	349,981
		—7,647	+20,240	—11,604	—1,179	—19,251
		—3.2%	+36.9%	—8.7%	—1.9%	—5.2%
April 1936	...	252,565	69,107	160,734	81,745	413,299
May 1936	...	228,079	75,109	121,902	62,294	349,981
		—24,486	+6,002	—38,832	—19,451	—63,313
		—9.7%	+8.7%	—24.2%	—23.8%	—15.3%
Jan.-May 1935	...	1,363,172	309,631	720,488	311,672	2,083,660
" 1936	...	1,231,810	300,135	742,050	324,097	1,976,860
		—128,362	—9,496	+21,562	+12,425	—106,800
		—9.4%	—3.1%	+3.0%	+4.0%	—5.1%

* These figures have been taken from the monthly statistics of the Central Bureau, The Hague, Holland.

Classified according to flag, the number of vessels which entered the Port of Amsterdam during June, 1936 was:—Netherlands, 124; Great Britain, 50; German, 19; Swedish, 19; Norwegian, 8; Danish, 13; American, 1; French, 3; Greek, 2; Lettish, 1; Finnish, 2; Polish, 1; Belgian, 1; Jugoslavian, 1; Russian, 8; Estonian, 1.

Vessels laid-up at Amsterdam:—1st June, 1936—5 vessels, measuring 27,494 tons gross; 1st July, 1935—13 vessels, measuring 85,608 tons gross; 1st July, 1936—5 vessels, measuring 18,169 tons gross.

Seaborne Goods Traffic of the Lower Weser Ports during May, 1936.

Total turnover in sea-bourne goods traffic of the Lower Weser ports during May, 1936, according to the Statistical Bureau in Bremen, increased from 673,455 tons in the previous month to 779,249 tons. Of this, receipts rose from 271,007 tons to 327,284 tons, and exports from 402,448 tons to 451,965 tons. Imports in May, 1935, were exceeded by 51,887 tons and exports by 126,351 tons.

Total goods imported through Bremen ports in May, 1936, were 271,123 tons, 65,052 tons more than in the previous month and 25,079 tons more than May, 1935. Compared with April, larger quantities of ores, mineral oils, fertilisers and timber arrived. The total arrivals of raw materials, therefore, increased considerably, although receipts of cotton, wool and coals decreased. There were also increases in frozen meat, wheat, rice, oilseeds, tobacco and coffee. However, the increase in importation of foodstuffs was negligible, due to decreases in receipts of rye, barley, oats and beverages. Finished manufactures incoming, due to larger arrivals of paper and metal goods, showed an increase over April, 1936.

The increase in imports via Bremen ports, compared with May, 1935, was chiefly due to the greatly increased amounts of some important raw materials, such as ores, mineral oils, cotton and timber, imported. Only imports of fodder, fertiliser and wool were considerably lower than in May, 1935. Tobacco imports via Bremen were far below those of the same period in 1935.

As in imports so in exports of the Bremen ports during May, 1936, there was a very favourable development. Exports exceeded April, 1936, by 30,961 tons, and May, 1935, by 51,525 tons. Compared with April, 1936, shipments of wheat, milled products, coals, stones and earth, as well as chemical products, iron, other metal wares and machines have increased. Smaller exports of rock salt, fodder and fertiliser were thus well counterbalanced. The increase in exports was distributed over all classes of goods.

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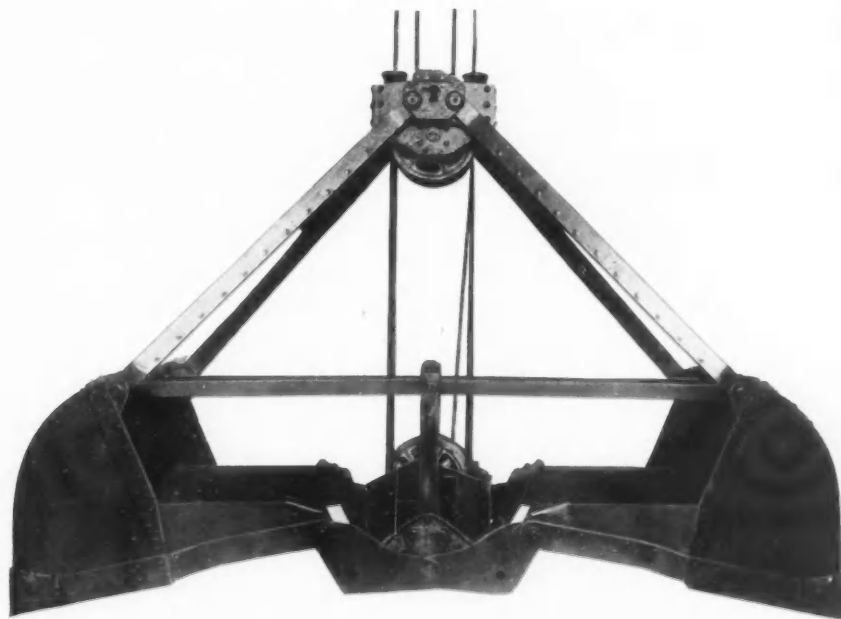
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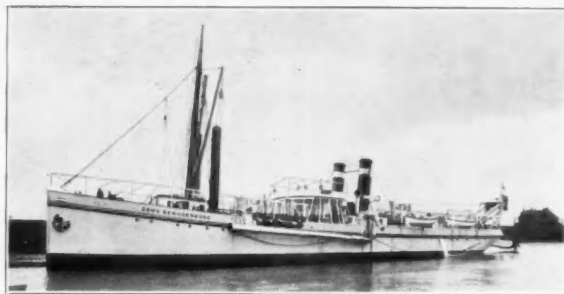
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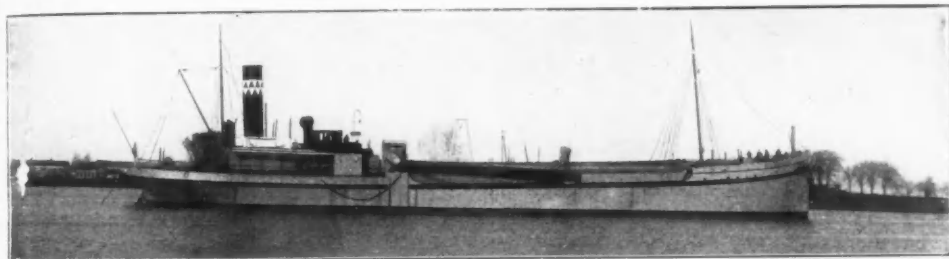


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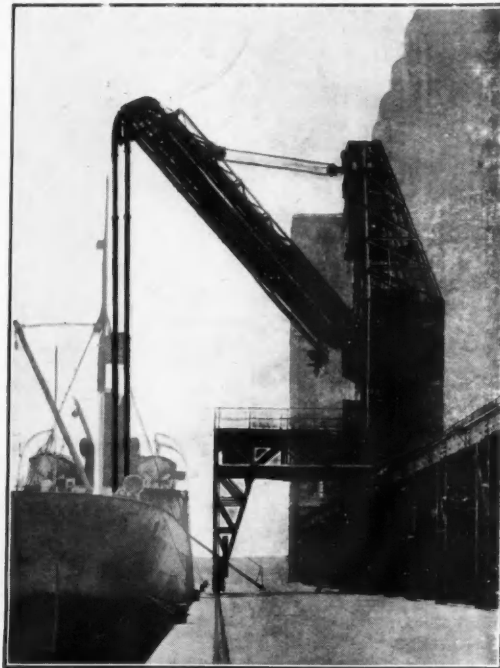
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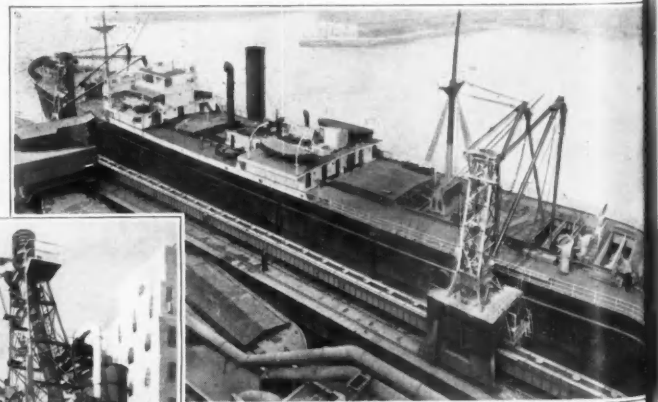
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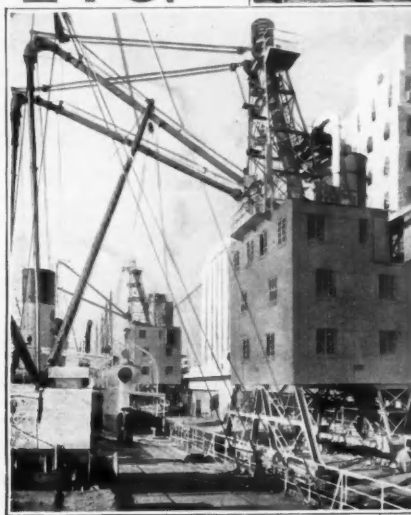
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